

The Iron Age

INDEX TO
READING MATTER
PAGE 32

A Review of the Hardware, Iron and Metal Trades.

INDEX TO
ADVERTISEMENTS
PAGE 19.

Published every Thursday Morning by DAVID WILLIAMS, Nos. 66 and 68 Duane Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXVII: No. 4.

New York, Thursday, January 28, 1886.

\$4.50 a Year, Including Postage.
Single Copies, Ten Cents.

Foreign Ironmasters in Russia.

The Russian Minister of Marine has published a denial of the statement printed by the *Novoe Vremya*, that the Admiralty had entered into an agreement with Cockerill & Co. for leasing to them Nicolaieff Dockyard for a term of years. The contract may not have been actually signed, says *Engineering*, but it is a matter of fact that the subject has been negotiated and is still under consideration by the Russian Government. At any rate, one or two points are beyond the reach of controversy. The Belgian firm have contemplated for some time past the establishment of a works at Nicolaieff, and shortly after the visit to their place of Admiral Shestakoff, the Minister of Marine, in the autumn, dispatched thither representatives who formally applied to the municipal council for the right to hold lands for a term of years for the construction of an engineering works. The proposition was publicly discussed, and so far the Cockerill business is proof against contradiction. A few weeks

aim is to establish a large ironclad fleet in the Black Sea as quickly as possible, and no consideration of sentiment and economy will be allowed to thwart the realization of her designs.

In spite of any exceptional agreement with Cockerill & Co. which Russia may make in order to render herself as quickly as possible the leading naval power in the Black Sea, the general policy of establishing foreign undertakings in Russia itself will be exposed to a vigorous discussion. Already the annual conference of the iron and coal trades of South Russia, assembled at Karkoff, has forwarded the Government a protest against the course taken by the Minister of Marine in encouraging in any way the erection of an establishment by Cockerill, and it is expected that the larger and more influential general conference assembled at St. Petersburg will pass the same resolution. Concurrently with this and the attacks of the Russian press on the older arrangement with Cammell & Co., at Kolpino, the *Novosti* has opened fire on a proposition of the Minister

says that this view is expressed, not because the committee reported in favor of the Armstrong scheme, but because their statements are less open to criticism, and on account of the notorious corruption that has always marked the relations between the official world at St. Petersburg and the Aboukhoff Works ever since the concern started operations.

Ericsson's Submarine Torpedo Gun.

A little more than two months ago the Delamater Iron Works, of New York, completed and shipped to England one of Captain Ericsson's improved submarine torpedo guns, of which we present engravings. Of all examples of submarine artillery this gun probably ranks first as regards efficiency, and its several details are ingenious throughout and well worth careful examination.

Briefly described, the gun, as our engravings show, consists of three cast-iron sec-

plug is in position the bolts *a a* are screwed down and everything is then ready for firing. The torpedo consists of $\frac{1}{2}$ -inch steel, and is made up of sections riveted together. A cast-iron chamber is screwed to the forward end for holding the explosive material. Into the end of this chamber a steel plug or firing-pin is inserted, cone-shaped inside, as shown in Fig. 6, so that in case the projectile strikes at an angle it will not glance off. Its rear end is furnished with several points to strike suitably arranged primers. By the arrangement adopted the striking of all the primers is insured, and the firing of the explosive charge in the torpedo cannot fail unless the whole number of primers should miss, and it is hardly within the range of possibility that all should miss when the front end of the firing-pin strikes a vessel or other body attacked with the impact due to the momentum of the projectile. The latter, exclusive of the explosives chamber, is hollow, and the rear half is of somewhat smaller diameter than the bore of the gun, being,

is readily heard through the bore of the gun, indicating that the valve is in place. The latter offers very little resistance to pressure from within the gun, will be shot away by the projectile as the latter begins to leave the gun, and will generally be broken into pieces. The central portion, being of soft material, will offer so little resistance to the firing-pin that there will be no danger of premature explosion of the charge in the torpedo. The gun itself can be lowered from the side of a man-of-war and then fired, or can be fixed into the bow of a vessel. In the former case either of the valves *E* and *E'* (Fig. 6) may be used, while in the latter case the valve *E* only is employed, a large swinging iron valve, however, being then arranged at the bow of the vessel so that it can be made to shut the mouth of the gun immediately after firing. This swinging valve is operated from within by suitable mechanism and prevents all but a small quantity of water from entering. When a shot is to be fired this valve, of course, is swung away from the muzzle, and

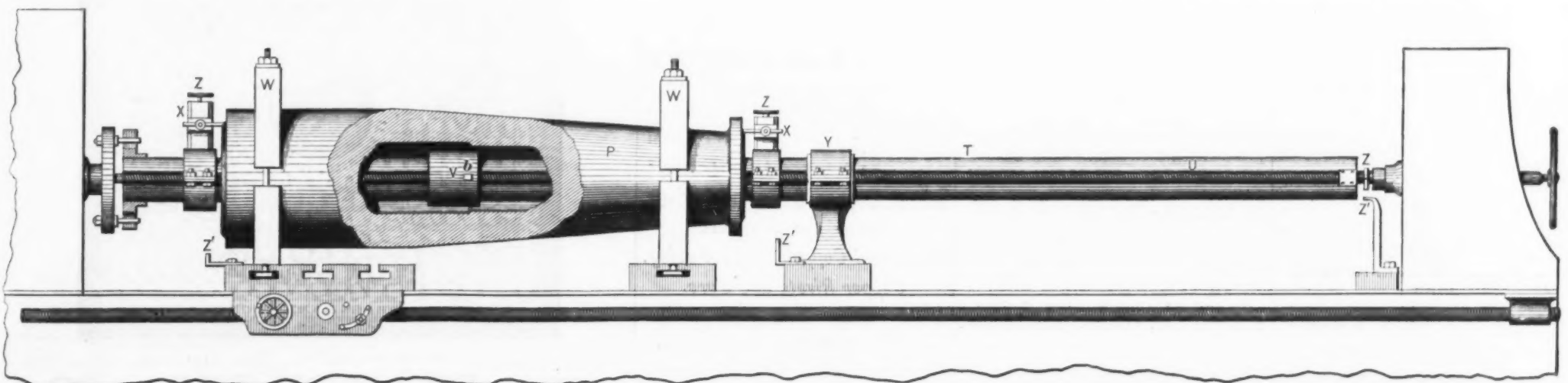


Fig. 1.—Boring and Facing the End Section of the Gun.

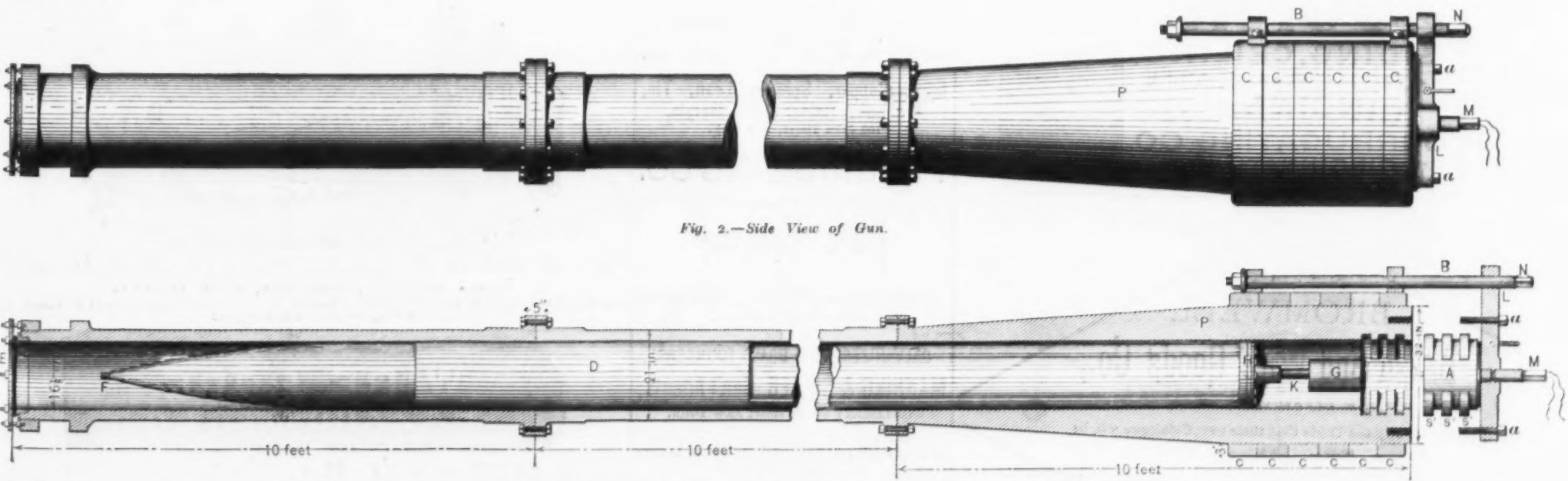


Fig. 2.—Side View of Gun.

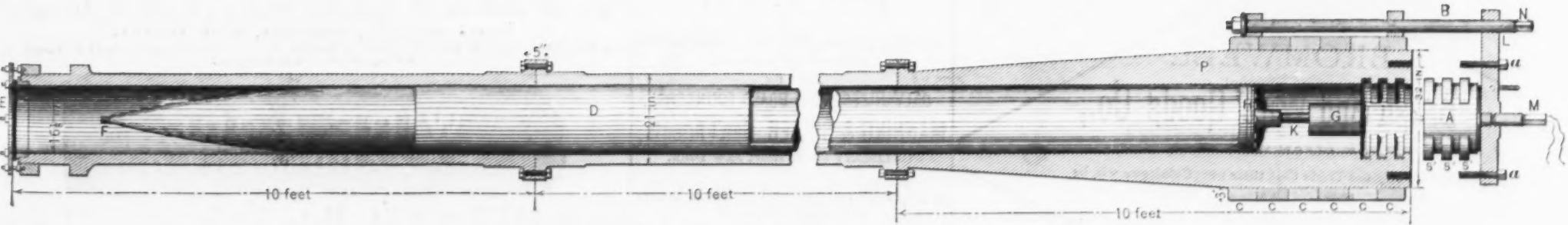


Fig. 3.—Longitudinal Section, Showing Torpedo, Powder-Can, &c., in Place.

ERICSSON'S SUBMARINE TORPEDO GUN, BUILT BY THE DELAMATER IRON WORKS, NEW YORK.

ago the manager of Cockerill's arrived at St. Petersburg to conduct negotiations for establishing a basis for Government support, and it was during these that the suggestion was made that the firm, instead of building a new works, should take over bodily Nicolaieff Dockyard. Of course no proof exists as to the course of these negotiations beyond what is verbally current in the higher naval circles at St. Petersburg, but we can say that in those circles the contradiction of the Minister of Marine is taken to mean only that the contract has not been actually signed. At first sight it may seem curious that a large dockyard should be handed over to a foreign company, but the proposition under discussion admits of plausible argument in support of it. Of late years Russia has built large workshops at Nicolaieff and filled them with costly machinery. She, however, possesses no adequate staff of practical and technical engineers to place in charge of it to produce the extensive results she aims at. Such a staff can only be supplied from abroad, and it appears wiser to the Russian Admiralty to allow Cockerill to work Nicolaieff Dockyard for it than for the Belgian firm to erect a second series of new workshops at Nicolaieff, outside the dockyard, and allow the first series, inside it, to remain idle. The adoption of the latter course would be in the end the more expensive one for Russia, while, what is more important still, a considerable time would be lost in erecting the new shops, which, in the present condition of affairs in the East, the Government begrudge. Russia's chief

of War to offer favorable terms to Messrs. Armstrong, Mitchell & Co. to establish a gun foundry in Russia. The *Novosti* publishes side by side the opinions of two commissions appointed by the minister to report respectively upon the Armstrong scheme and the condition of the Aboukhoff Works, at St. Petersburg. The Aboukhoff Steel Works were established years ago as a private State-aided concern for the manufacture of heavy steel ordnance, and, after collapsing, was taken in hand by the Government and kept going by a nursing process which has proved very expensive and repeatedly involved the Government in discreditable scandals. The erection of a new works by Armstrong would compete seriously with, and perhaps put an end to, the Aboukhoff one, and consequently, as might have been expected, the two committees reported one against the other. In our own country instances are not unknown of hasty opinions and ridiculous recommendations formulated by committees, but publicity exercises a wholesome check upon such official extravaganzas as are disclosed by the *Novosti*, where the facts as well as the opinions of the two committees run counter to one another, and the conclusion is forced upon the reader that either one of the two committees did its work badly and reported from interested motives, or else that both were bad in this respect. Judging from the generality of the opinions expressed, the commission appointed to examine the Armstrong project appear to have been the fairest and the least unbiased. *Engineering*

tions, each 10 feet long, having a bore of 16½ inches, and bolted together in the manner indicated. The breech section tapers, as shown, to give increased strength, and is reinforced by six steel rings, *C*. Between the projectile *D* (Fig. 3) and its projecting charge is a piston, *H*, fitted gas-tight to the bore. The box *G* which contains the projecting charge of powder is of a diameter much smaller than the bore of the gun, and is attached to the piston *H* by a wooden supporting-rod, *K*. The powder-case, it will thus be seen, occupies only a small portion of the space left in the chamber of the gun between the piston and the breech. The breech-plug *A* is furnished with thrust collars *S S S*, whose arrangement and functions will be readily understood from the illustration. The plug is supported by a sliding bar, *B*, through the intervention of a swinging crosshead, *L*, and when withdrawn from the gun can be swung to one side, as in Fig. 5, by means of a long lever, *Q*. When in this position it is held in place by a small pawl, readily enabling the loading of the gun to be performed. After loading the breech plug is swung back into place, pushed into the gun, as shown in the side view, Fig. 2, and one-sixth of a turn is given to it by means of a smaller wrench, *R*, locking the thrust collars. These collars were turned to steel gauges and then scraped by hand to a fit that would allow them simply to turn, but not shake in the least. Through the center of the breech-plug pass the wires for exploding the charge in the tin can *G*, a small dynamo being used for this purpose. After the

moreover, furnished with longitudinal steady-ing fins. To counteract the tendency of the front and heavy end of the torpedo to sink, Captain Ericsson supplied an ingenious device, shown in the detail view, Fig. 7. It is in effect a rudder, *R*, placed on the top of the torpedo and forced upward by a spring, *S*. It is hinged at one end, and, accordingly, offers no obstacle to the insertion of the torpedo into the gun. One of the steadying fins mentioned is here shown, being marked *E*. The torpedo, as will be seen, occupies nearly the whole length of the bore of the gun in front of the piston *H*. To the muzzle of the gun a frangible valve is secured which serves to exclude water from the bore of the gun before the discharge of the projectile, but which is destroyed by the latter upon firing. This valve, as it is called, is shown at *E*, Fig. 3, and consists essentially of a rubber disk held in position by a ring firmly bolted down. In Fig. 6, which is an enlarged view of the muzzle end of the gun, we show both this valve and another valve *E'* which serves practically the same purpose, but is inserted from the breech by means of a rod. This valve is made of thin cast iron and is furnished with a central orifice closed by a rubber diaphragm. Along its circumference are arranged projecting springs or hooks which catch into a rabbet provided around the interior of the muzzle of the gun and prevent the water from forcing the valve back. The clicking noise made by the springing of these hooks into the rabbet

the valve *E'* is depended upon to prevent water from entering. Having thus briefly outlined the main features of the gun, it may not be without interest to some of our readers to give attention to some of the methods adopted in its construction. The work naturally required extreme nicety in its execution, and being rather heavy afforded ample opportunity to bring into play "shop wrinkles." Throughout the work was carefully planned and finely executed. The main points to be considered were the boring and fitting together of the different sections, the shrinking on of the steel rings *C*, and the cutting of the thrust rings *S S S* (Fig. 5). For the first of these operations we refer our readers to Fig. 1, which shows the breech section *P* of the gun in the boring mill. It was found that in placing a 10-inch boring-bar of sufficient length to bore the 10-foot gun sections on the centers of the boring mill there was a sag of fully $\frac{1}{2}$ inch. This, of course, would not answer for the work in hand, and accordingly a bar of about twice the length of the breech was put on the centers, with a third bearing at *Y*. In this way no difficulty from sagging was experienced, and an unusually straight bore and a fine surface were accordingly obtained. The boring bar was arranged with a traveling head, *V*, and the gun section remained stationary while boring. In this way both ends of the work could be faced at the same time that the cut was running through. The feeding of the

(Concluded on page 7.)

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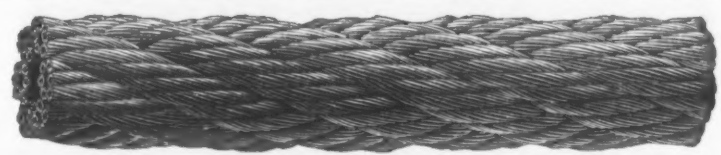
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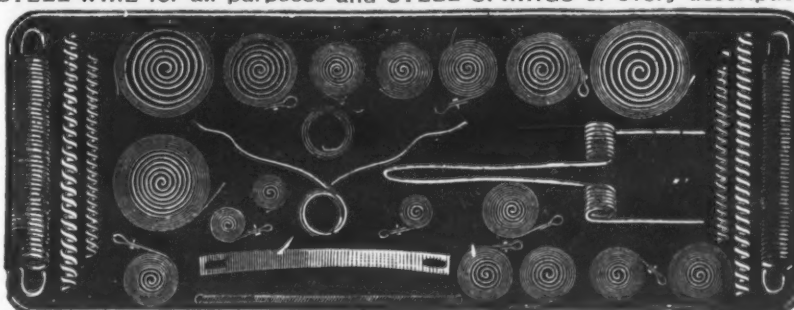
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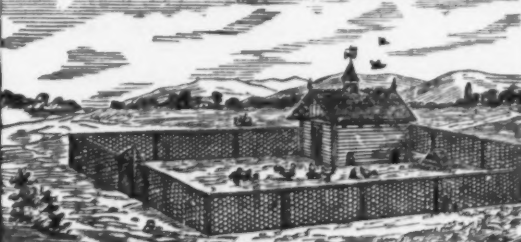


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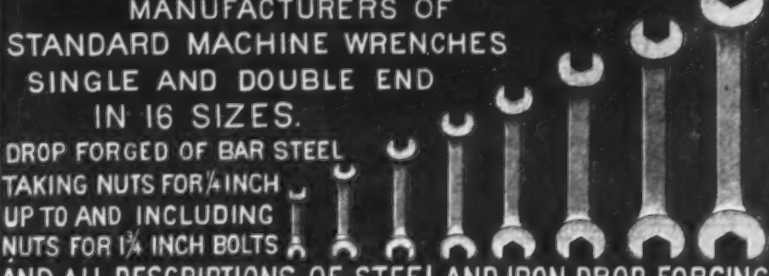
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Skelp, Blue Annealed and Common.

The Sums Directly Involved in the Passenger War.

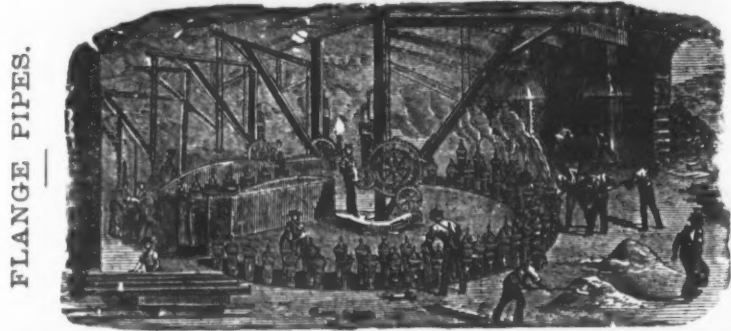
Mr. Albert Fink has given some interesting figures concerning the interests directly involved in the fight between the Baltimore and Ohio and Pennsylvania railroads. The fight involves all the other roads, and many lines having nothing whatever to do with the war have to pay a penalty, while innocent stockholders are made to suffer most severely. The passenger earnings of all the roads affected by the cutting of rates by these two lines amount to \$50,000,000 a year. The Baltimore and Ohio wanted to get the use of the Pennsylvania road from Baltimore to New York. The Pennsylvania road were willing to give Mr. Garrett the use of this line permanently, but refused to give it temporarily—that is, until the Baltimore and Ohio should complete its rival lines and get into New York, a fully-equipped competitor with the Pennsylvania road. At first the Baltimore and Ohio did have such an arrangement with the Pennsylvania, but that road concluded to break the arrangement in 1884, when they discovered, as they claim, a disposition on the part of the Baltimore and Ohio to parallel their line. The question who is right in the quarrel is difficult to decide. Of course each road ought to have the right to control their own property as long as the public is properly served. I think that railroads should establish judicious and equitable tariffs and stand by them. They should not be allowed to make unreasonably low rates to injure other or rival roads, or merely to fight lines with a view of forcing them to yield to their demands, and then when the point has been gained to put up the rates again. Altogether it is a difficult matter to regulate tariff by legislative enactments. The proper way is to submit all questions under dispute to arbitration, to be settled on principles of equity, and to protect innocent parties against unjust losses. It is not lawful for a man to set his house on fire to spite a neighbor, at the risk of consuming a whole city.

The trunk railroads have formed an association to protect themselves against the evil effects of railroad wars. The trunk-line compact lately made has this for its object. It provides that all questions arising between parties to the contract that may lead to war shall be settled by arbitration. The Baltimore & Ohio are a party to this agreement so far as freight is concerned, but, unfortunately, not in regard to passenger traffic. The trunk-line contract in this instance has had the good effect of keeping the war confined and preventing a general cutting of rates. But for this there would have been a complete demoralization of passenger rates between New York and the West. The total earnings of the roads would have been affected, and each road would have sold tickets at rates to suit itself. The majority of the trunk lines, by acting together, instead of fighting, present a solid front against cutting rates, and they will prevent a general passenger war. The total passenger earnings of the New York trunk lines are \$26,000,000 a year, \$17,000,000 of which are local earnings, and \$9,000,000 are on business that goes to and comes from other roads. Now the earnings involved in the present controversy amount to no more than \$800,000 a year on east and west bound passengers—that is, between New York and Chicago, St. Louis and Cincinnati—over the seven trunk-line roads. The interests of the Baltimore and Ohio road in this controversy do not exceed \$125,000 a year, even when rates are maintained, and this is the amount they are fighting about at the risk of distributing the \$26,000,000 earnings of the other roads. Some way ought to be found to settle these disputes without imperiling the business of the country and unsettling securities and public confidence. It is almost criminal that so small an interest should be allowed to injuriously affect so great a proportion of the country's wealth. In regard to the loss imposed on the weaker lines, that is regulated by the system the pool has organized. The Erie and West Shore roads will be protected. The loss to each will be small in case of a prolonged war, because the receipts are pooled and divided among all the roads, and thus the weak are protected by the strong lines—all helping each other and sustaining the business interests of the country.

Cleaning New Rubber Corks and Tubing.—New rubber corks and tubing are always coated with more or less sulphur, and perhaps also some of the "filling" that is often added to them (which is often powdered soapstone). Mere washing in water will not remove this coating, especially from the inside of tubing. It is best gotten rid of by boiling the goods in a solution of one part of sulphide of sodium and two parts of caustic soda in 10 parts of water. The tubing should be lifted out of the liquid occasionally, and carefully reimmersed, so that new liquid will pass throughout its bore. After having been thoroughly boiled in this manner the goods are carefully washed in water. If the tubing is previously treated with warm water and thoroughly kneaded or beaten, so as to loose the coating adhering to the inside, the above described cleaning process will be much more thorough.

The lead industry in the North of England is probably the only one of the mineral industries in which any improvement has been noticeable over a large part of the year 1885. In 1884 and 1885 there was a very considerable reduction in the production of British lead. There was also a considerable decrease in the imports of lead from Spain, because of the cholera outbreak; and there has been concurrently an increase in the export of lead, especially in China. One of the largest of the lead-mining companies in the North of England sold lead, at the worst period of 1885, as low as £10. 5/8 per ton in March last; but before the end of July—its financial year then ending—it made sales at £12. 4/10, and this advance in price has since continued. Some of the largest producers of lead have closed their mines altogether for a time. Some attempt has been made, but with only partial success, to obtain a reduction of the royalty dues.

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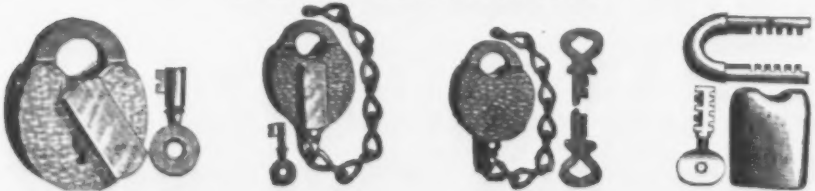
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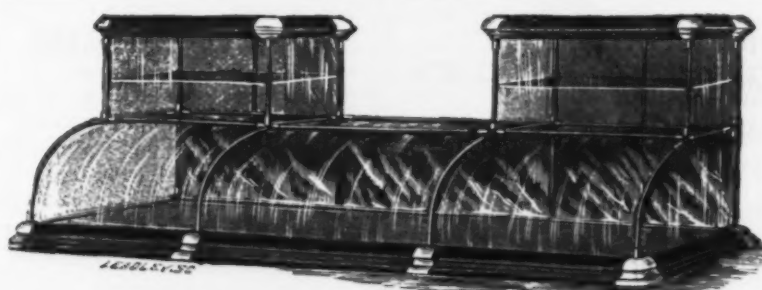
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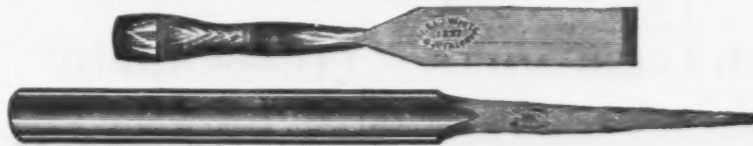
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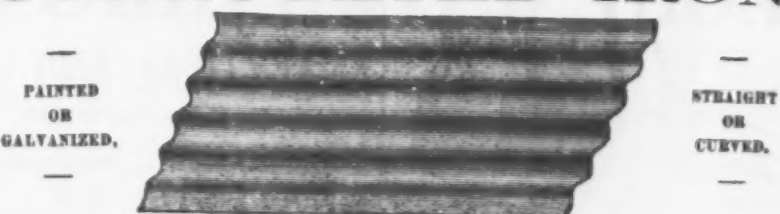
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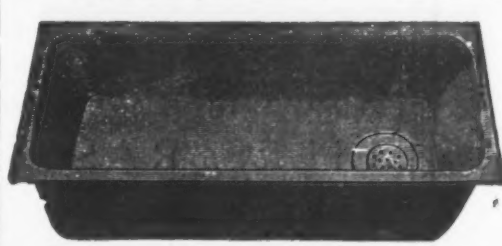
FIG. 180.



FIG. 209.



FIG. 70.

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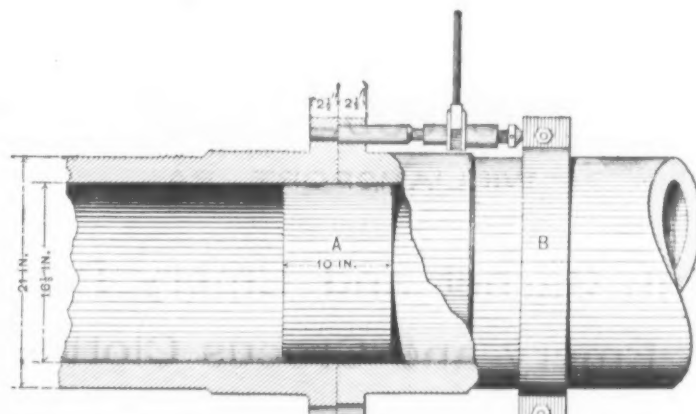
CONHOES IRON FOUNDRY & MACHINE CO., CONHOES, N. Y.

(Concluded from page 1.)

head V was accomplished by a star, Z, on the end of the screw U coming in contact with the projection Z', bent at the top and commonly termed "kicker" by the men. If a coarse feed be desired a number of these stars are put on, and vice versa. The facing cuts were performed in the same manner, the cut showing the arrangement very clearly. Three tools are thus acting automatically at the same time. After finishing the boring and facing, the thrust rings S S S were cut. To do this the boring-

side, about 2 inches apart, was then arranged around the ring, and water was projected close to the bottom joint of the rings, cooling the lower edge of each ring, and thus causing the other part to draw down to where the metal was already sufficiently cool to pinch the gun section. After all the rings had been shrunk on the section was again put in the turning lathe and the rings were turned and polished.

The gun as turned out at the Delamater Works was eminently satisfactory in all respects and was accepted by the English Government, after careful inspection. It was



Ericsson's Submarine Torpedo Gun.—Fig. 4.—Reaming the Flanges of the Gun Sections.

bar was removed and a special cast-iron head was bolted to the face-plate of the mill. By means of this and of two small angle-plates a small facing-arm was introduced into the breech, readily enabling the cutting of the rings. The other two sections of the gun were bored and faced with the same bar and facing-arms X X. After boring and facing each section special cast-iron centers were inserted into the ends and the several sections were put into a turning lathe for turning the flanges and the extreme end

shipped to the Royal Arsenal at Woolwich, England, on the steamship Greece, of the Monarch Line, during the latter part of November of last year. We understand that it is now on exhibition at that place.

English Shipbuilding in 1885.

From all available accounts it would appear that the year 1885 will long be remembered as one in which the English shipbuilding trade has suffered the greatest depression. On the Clyde there were launched 241 vessels of 103,458 tons, as compared with 296,854 tons in 1884, showing a decrease of 103,396 tons. In 1879, the last period of depression, the output was 174,750 tons—18,708 tons less than in the present year. In 1877 also the output was less than that of 1885, but it was considerably affected by the long struggle between masters and men, which lasted for months, so that for the greater part of the year there was no work in the shipbuilding yards. In 1876 the serious depression was unaffected by strikes, and the output was 18,634 tons less than in the present year. The following table gives the amount of tonnage launched on the Clyde during the last 16 years:

Year.	Tonnage.	Year.	Tonnage.
1885.	103,458	1877.	169,719
1884.	296,854	1876.	174,824
1883.	419,064	1875.	311,824
1882.	391,384	1874.	362,589
1881.	341,022	1873.	292,526
1880.	241,114	1872.	230,847
1879.	174,750	1871.	196,229
1878.	222,353	1870.	190,401

The returns from the various shipbuilders show clearly the extent of the depression. One noticeable feature in the returns is the steadily increasing use of steel and the greater favor with which it is regarded by both shipbuilders and shipowners. The following table clearly shows this:

Year.	Total tonnage of steel.	Percentage of steel to total tonnage.
1879.	174,750	18.00
1880.	241,114	24.00
1881.	341,022	26.69
1882.	391,384	19.54
1883.	419,064	12.61
1884.	296,854	13.57
1885.	103,458	9.67

Another feature is the great increase in the working pressure of boilers which has taken place in the last two years, pressures of 150 and 160 pounds being now quite common. Triple-expansion engines are rapidly replacing the old compound form of engine, and their success is very gratifying. At least two firms on the Clyde—Messrs. Denny & Co., Dumbarton, and Messrs. Rankin & Blackmore, Greenock—have been encouraged to go a step further and to produce quadruple-expansion engines, one large set of which the former are now fitting into a steamer, while the latter are fitting their patent engines to a large yacht. The latter engines have six cylinders, three cranks, and the boilers will work at 180 pounds

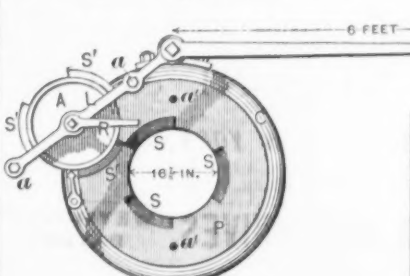


Fig. 5.—End View of Gun, Showing Breech Plug Removed.

of the breech section for the re-enforcing rings. The next operation, that of drilling and reaming the flanges of the gun sections, was performed by putting the several sections on a horizontal drilling machine. This was so arranged that the 16 holes in each flange could be drilled without turning the work. After drilling the holes about 1/16 inch smaller than the finished size they were reamed in the same position saving time and insuring accuracy, since, after one-

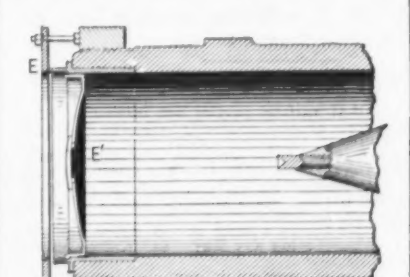


Fig. 6.—Enlarged View of Muzzle End of Gun, Showing the Two Muzzle-Valves.

half of the flange joint had been reamed in the position in which it was drilled, the reamed hole was not only much more likely to be square with the face of the flange, but also formed a guide for the reamer in reaming the second half of the joint. This will be understood from an inspection of Fig. 4. The ratchet is here shown backed up with a wrought-iron strap, B, clamped on the gun. To save time in drilling, a cast-iron ring was made with the

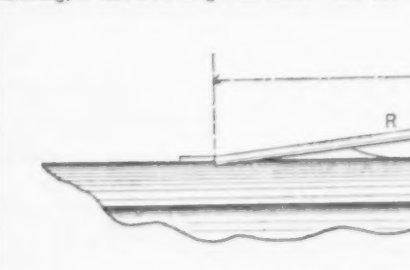


Fig. 7.—Detail of Torpedo, Showing Rudder.

boles laid out, and a steel bushing was fitted to guide the drill. This ring was kept in place by another cast-iron ring made to fit the bore of the gun and of the template ring. After drilling the first hole a steel plug turned to fit the drill size was inserted to prevent the template ring from turning. This plan was also adopted for reaming the holes, as shown in Fig. 4. The bolts through the flanges holding the gun sections together were made a driving fit.

In shrinking on the re-enforcing rings C, shown in Figs. 2, 3 and 5, the breech section was arranged with the breech end up, and as each successive ring was heated and put in place it was held in position by large eye-bolts with hook jaws. A circular pipe with small holes on the inner

pressure. The engines of Messrs. Denny are of the two-crank tandem arrangement, and by means of additional patents it is intended to still further simplify and improve this type of engine. These and other less important improvements go far to relieve the year of its barrenness, so far as shipbuilding and engineering are concerned. The increased economy of such engines, the decreased weight and smaller consumption of coal, cannot but have the effect of increasing the demand for ships so engined, and thus relieve somewhat the prevailing depression.

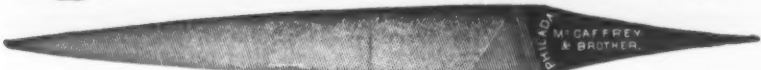
In Dundee the year has been one of gloomy depression; one of the yards is virtually closed, two are on short time, and there are only six vessels on hand, four of which are

Paris, 1878.

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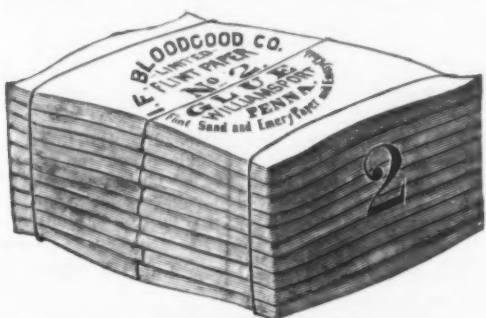
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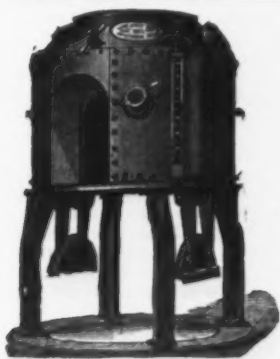
We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

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EAST WILTON, May 26, 1884.



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Flat Wood,
Gang Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single-cut,
Handsaw Taper, double-cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
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Tumbler Files,
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RASPS.

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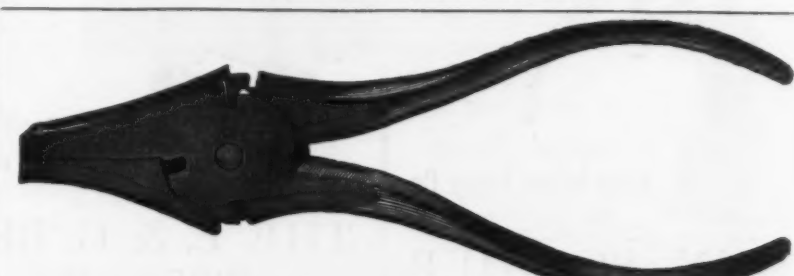


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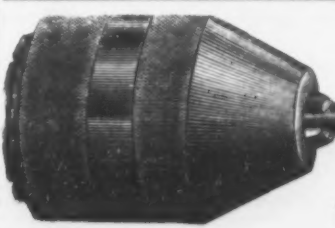
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EASY TO TAKE APART AND CLEAN. BEST OF WORKMAN-
SHIP AND VERY CHEAP. Manufactured and sold by
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stock boats. During 1885, 13 vessels of a
combined tonnage of 7358 were launched,
as compared with 12 vessels of 12,062 tons
last year. In Aberdeen the number of ves-
sels launched was fewer than usual, and the
tonnage was lower than at any time since
1879. The vessels launched were seven in
number, of 6246 tons, as compared with seven
vessels of 7661 tons in 1884, and 16 vessels
of 11,628 tons in 1883. The outlook for the
ensuing year is disheartening in the extreme.
In Leith shipbuilding has also been in a
depressed and unremunerative condition
throughout the year. The report of ship-
building on the Wear shows the severity of
the existing depression. Three years ago
Sunderland held a high position as a ship-
building port, being second only to the
Clyde; but since then this industry has suf-
fered to a considerable extent, partly owing
to circumstances of a local nature. In 1882,
the most prosperous year, a tonnage of
212,464 tons was registered, and in 1883 this
total was only reduced by 151 tons; but in
1884 the downward career of shipbuilding
on the Wear commenced, which was largely
accentuated by strikes, more especially the
one in the marine-engine building trade,
which cost the employers something like
\$600,000 and the employees \$1,000,000.

One the Tees several of the yards have
been closed for some months. The ship-
building trade on the Mersey during the year
has been comparatively slack, and so far as
present appearances go the prospects of the
present year are not encouraging. At Bar-
row-in-Furness the year's work has been by
far the smallest ever experienced, only one
yard being really engaged in shipbuilding—
viz, the Barrow Shipbuilding Co., who have
launched four vessels of 5958 gross tonnage.
Not a vessel of any kind has been launched
since May, owing to the very serious fire
which occurred last August, when the whole
of the engineering shops were completely
destroyed. On the Tyne there has been a
decrease of over 20,000 tons during the year,
the total number of vessels built having been
105, with a gross tonnage of 102,993, as com-
pared with 124,221 tons in 1884. At Bristol
the shipbuilding trade has for some time
been insignificant; the tonnage during the
year has only been 1500, as compared with
903 tons in 1884. At Belfast the gross ton-
nage of vessels launched during the year is
33,375 tons.

English Letter.

(From Our Regular Correspondent.)

LONDON, JANUARY 11, 1886.

THE OUTLOOK

has not altered very much during the week,
but there has been a pretty general resump-
tion of operations and a commencement of
arrangements for the new current year. In
the course of this and next week matters
will get into full swing again, and the quar-
terly meetings of the iron, &c., trades hav-
ing taken place this week, traders generally
will be in a better position to estimate the
possibilities of the near future with greater
accuracy than just now, when everybody
and everything are but emerging from the
chaos of the holidays and the confusion of
stock-taking. At the moment, therefore,
some little uncertainty prevails as to prices
and the run of orders, but it may be ad-
mitted that there is a hopeful feeling abroad.
Much of this tone is doubtless due to the
steady improvement reported from the
United States. That change is valuable
morally, but that it is also of very material
worth is amply demonstrated by the Board
of Trade returns for December, during
which month greatly enlarged quantities of
pig iron, tin plates, hardware and cutlery,
old iron, unwrought steel, &c., were
exported by us to your market. Even
in its early stages, therefore, the improve-
ment has been of real practical utility to us,
so that one need not wonder that all our
eyes are upon your market. There are cer-
tain other indications from South Africa,
India, &c., which betoken coming changes
for the better, so that on the whole our hope-
fulness is not ill-founded, and those who
prefer moderate optimism have fair war-
rants for their views. Probably more would
have been done at the works but for the
very inclement weather, the snowfall and
frosts having been much more severe than
for many years past.

THE AMERICAN EXHIBITION IN LONDON
has been postponed from May, 1886, until
May, 1887, as you will have been informed
by telegraph. All things considered, the
postponement is wise and sagacious, for the
great Indian and Colonial exhibition will
this year prove the center of attraction, and
would have largely overshadowed the Ameri-
can undertaking. As the latter gives prom-
ise of being a big thing, it is better that it
should wait a year and have the field all to
itself rather than be forced on in the face of
a rival show possessing all sorts of Royal,
Government and other influential patronage
and support.

THE LABOR QUESTIONS

alluded to in some of my communications
are now taking more serious shapes, and in
some cases threaten to end in strikes or
lockouts. The following summarized state-
ments give an accurate representation of the
present position of these agitators, &c.,
in such trades as are likely to interest your
readers. The Arbitrator of the South
Staffordshire Mill and Forge Wages Board
has just given his decision, which is: "That
puddlers' wages shall continue at 7/3 per ton
till January 16 inst.; that from and after
that day puddlers' wages shall be 6/9 per ton
for a period of three months; that wages of
mill and forge men shall be regulated by the
above rate in the same manner as hereto-
fore; that from and after the aforesaid
period of three months the above award
shall be subject to one month's notice, to be
given at the end of any week, by either side
of the board." The Iron Trade Association
has resolved to give notice to the engineer-
ing workmen of the whole country of a
reduction of wages of 7 1/2 % on the rates
paid in the early part of 1879. The reasons
alleged are the depressed state of trade and
the higher cost of production. At Belfast
the men have already accepted the reduc-

tion; at Birmingham and Liverpool it will
act after January 22; elsewhere on and
after January 31. On Wednesday the
quarterly certificate of the average price of
No. 3 Cleveland pig iron was issued by the
accountants employed by the Cleveland Iron-
masters' Association and the Cleveland
Miners' Association. The certificate states
that the average price for the quarter has
been 32/2.99, against 32/8.16 for the pre-
ceding quarter—a decrease of 5.17 d. per ton,
equal to a reduction of about one-twentieth
of a penny per ton in the miners' wages.
At Sheffield the engineers and ironworkers
will be reduced in wages by from 7 1/2 % to 5 %.
At the same place the well-known edge tool
firm of Ward & Payne have asked their men
to accept a reduction of 15 %, failing which
they will no longer make tools for stock.
The men say they will resist. All the men
engaged in the shipbuilding yards on the
Tyne have turned out on strike against a
reduction of wages. It is feared that the
example will be at once followed by the men
working on the Wear, and that no fewer
than 9000 men will be thrown idle in the
midst of a population already supported in
part by distress funds. The Sunderland
Town Council has resolved to memorialize
the Local Government Board for leave to
borrow £9000 to be expended in providing
work for the unemployed workmen in the
town. It is proposed to construct a prome-
nade and carriage drive along the sands at
Roker—a seaside resort. At present there
are upward of 10,000 persons receiving food
from the Borough Relief Committee, and it
is feared that, should the threatened strike
in the shipbuilding trade not be averted, the
supply of food will almost cease, the trades-
men and public men declaring that they will
stop contributions. The fears of an exten-
sion of the distress were partially confirmed
on January 7, when the workmen connected
with the Boiler Makers' Society who are
employed in the shipbuilding yards came out
against the proposed reduction. At Bir-
mingham there is much suffering among the
unemployed, and a meeting is arranged for
to-day to "organize the men into a labor
army, which shall conquer in justice and
utterly overcome starvation and suffering.
No longer," continues the handbill, "shall
innocent children starve and strong men lie
idle." The quarrymen of North Wales are
on strike, and the Lancashire cotton spinners
have decided to make another reduction in
addition to the drop of three months ago.
In parts of Scotland there are serious dis-
turbances among the coal miners and other
men who have no, or only part, work. On
January 8 a meeting of about 5000 unem-
ployed, convened by the Glasgow Trades
Council, was held in Glasgow Green, when
resolutions were adopted declaring that
great destitution prevailed in Glasgow and
that the present measure of relief is totally
inadequate, and that the wealthier classes be
appealed to. Committees were appointed to
carry out the object. One speaker con-
demned the "labor test" for decent artisans,
and said it should be only applied to loafers.
The majority of the meeting were young
men. A meeting of the operatives engaged
in the South Staffordshire and East Wor-
cester tube trade was held on January 8,
when it was decided to continue the strike
at the works where employers insisted upon
enforcing 10 % reduction in wages and the
hour system. The employers state they are
compelled to reduce wages in order to com-
pete with other manufacturers both at home
and abroad. In several other branches of
industry the rates of remuneration are being
rearranged. The employers almost univer-
sally would prefer to have the hours of labor
lengthened, but the men, especially those
employed in the engineering trades, are so
bitterly opposed to the extension of their
present hours that the masters have not felt
able to face the real issue direct in the
face.

THE IRON MARKET.

The new year has hardly opened with those
prospects of encouragement which were
generally anticipated just prior to closing
down for the Christmas and New Year holi-
days. Some little difference of opinion is
manifested as to the prospects, but the pre-
ponderance is in favor of a more hopeful
feeling, the lowness of prices notwithstanding.
Any change that comes about to be
for the better. On the other hand, how-
ever, it is reported that lots have been
bought at prices several shillings lower than
those which ruled about five or six weeks
ago. As to work in hand nothing for special
mention has transpired during the week,
and generally matters remain in statu quo.
Scotch warrants have been easier in Glas-
gow, closing on Thursday at 40/4 1/2, and
dullness has prevailed at Middlesbrough with
32/3 for No. 3. In Staffordshire transac-
tions have been practically carried over
until after next week's quarterly meetings,
while at Barrow a firm and good tone has
for the most part ruled, mixed numbers
being from 44/6 to 45/1. In Swedish brands
there has been a fair demand for the better
grades with a guaranteed percentage of
silicon and a low percentage of phosphorus;
but prices are 5/ below what they were a
year ago, and the prospect of an increase is
not in view. The common class of Swedish
pigs continues to be a drug on the market,
and wire is still in a depressed condition,
with prices regarded as wholly unremuner-
ative. Both the Indian and the Levant
markets are stagnant because of war ru-
mors and of military operations. In fen-
cing-wire and in galvanized sheets busi-
ness has been quiet, though not more so
than before the holidays. Heavy manufac-
tured iron and ordinary brands of merchant
iron are for the most part dull, with prices
unchanged and without much prospects of
large orders to take the place of those
being worked off. The Commissioners of
the American Exhibition, to be held next
year at Earl's Court, London, have just
placed some contracts for the buildings in
the hands of Belgian iron firms; the other
work is being chiefly done across the Atlantic.
For old material there is a steady demand,
cheap parcels not being procurable, and there
is a reasonable expectation of a rise in prices.
At present the figures are as follows: Old
double-headed iron rails from 54/ to 55/;
No. 1 heavy wrought scrap, 45/; old iron
boiler tubes, 42/6 @ 45/; old cast iron, 38/6
@ 40/; old flange rails, 52/6 @ 53/6, f.o.b.,
London or other British ports. Freight.—

HALL & ELTON'S GERMAN SILVER

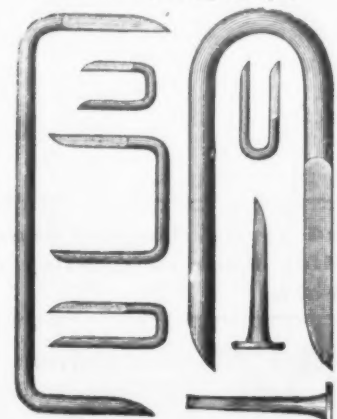


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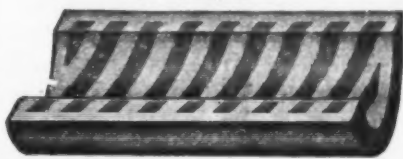
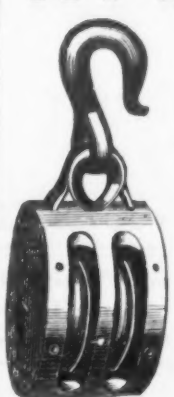
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These remain unaltered for the most part. With regard to the operations of the Australian "ring," it is reported that the struggle between the "ring" and the opposition is drawing to a close, or that, at least, the 7/6 rate has been condemned to an early extinction. Glasgow to New York is still 7/6 @ 10/7 ton for pig iron by ordinary steamers. Steel.—This is quiet in all departments, although all things considered some of the works in the North are tolerably well employed. Steel sleepers are being found a source of much consolation just now, and some of the firms engaged in their production have orders in hand to keep them going pretty well for the next four or five months. Old leaf spring steel is steady at from 52/6 to 55/6, f.o.b. London or other British port, and lots are more or less scarce. Steel Rails.—No change can be chronicled in this department. The Victorian order for 40,000 tons of steel rails, with accessories (and not, as has been reported elsewhere, 40,000 tons of accessories), is still the subject of much conversation. A portion of the order, viz., about 2500 tons, has gone to Cammell & Co., Sheffield, and at the association price it is believed.

SCOTCH PIG IRON

is quiet, but the depressed feeling produced by the publication of the unfavorable annual statistics has to some extent been lightened by the continuance of good reports from the United States.

THE BOARD OF TRADE RETURNS

for December, and consequently for the complete year 1885, have just been issued, and present several features of more than ordinary interest. On the whole year the imports decreased by £15,940,235 and the exports by £10,993,835.

The totals of imports for the month, for the year, and for the two preceding Decembers and the two previous years, are:

	Imports.	Year.
December.		
1885.....	£31,143,598	£273,834,314
1884.....	17,840,103	329,025,342
1883.....	33,073,970	399,774,549
1882.....	33,871,131	425,003,932

The totals of the exports for the month of December in 1885-84-83, and also for the three years, are:

	Exports.	Year.
December.		
1885.....	£17,304,426	£213,631,407
1884.....	17,840,103	329,025,342
1883.....	15,971,102	239,799,473

The following are the totals of the exports of iron and steel for the last month in each of the three last years, and for the three years:

	Iron and Steel Exports.	Year.
December.		
1885.....	£1,598,702	£21,717,136
1884.....	1,779,961	24,436,035
1883.....	2,007,000	28,580,216

As compared with December, 1884, the exports of iron and steel for the month show a decrease of £191,199. For the year as compared with 1884 the decrease is £2,778,899.

TO THE UNITED STATES

during the month of December the principal lines of export were as under:

Articles.	Month of Dec. 1885.	Month of Dec. 1884.	Month of Nov. 1885.
Alkali, cwt.	254,709	280,210	333,199
Hardware and cutlery, &c.	25,019	19,971	24,464
Iron—Pig, tons.	33,708	13,312	10,804
Bar, angle, rod, &c., tons.	1,985	1,373	275
Railroad, all, tons.	308	.....	37
Hoops, sheets, plates, &c., tons.	996	1,676	1,410
Tin plates, tons.	16,551	13,897	18,417
Cast or wrought, tons.	179	83	259
Old, tons.	3,887	717	1,945
Steel, unwrought, tons.	2,678	1,546	3,154
Lead, all sorts, tons.	1	13	52
Steam engines, &c., &c.	1,172	4,776	4,713
Other machinery, &c., &c.	30,054	25,109	23,846
Tin, unwrought, cwt.	477	107	306
Special return—Iron rails, tons.	.....	.....	.....
Steel rails, tons.	302	.....	35

TIN PLATES.

In London there has been very little business done this week, and, though the market may be described as steady and fairly strong, it is undoubtedly quiet, and unless buyers show a little more life between now and the end of the month some of the makers will be very poorly off for work. I quote for good ordinary brands of IC cokes 14/ @ 14/6 f.o.b. Liverpool. At Liverpool the new year does not open very auspiciously so far as the tin-plate trade is concerned, and the question is as to whether or not the combination to reduce the output of plates will continue for the half or whole of this year. When this point has been finally settled we shall see some considerable business done at either higher or lower prices. There have been several good lots of coke tins placed at 13/9 @ 14/ IC, and any further lots they may be offering at these figures will be taken up at once. There has not been so much doing in either Bessemer or Siemens steels with coke finish this week. After the few sales made at 14/ @ 14/6 IC respectively for the two qualities there has been no further receding in prices, and it is to be hoped that the next turn will be in an upward direction. The demand for charcoal tin plates as well asterne tin plates is still of a limited character, and prices are not by any means firm. The figures for the former vary from 16/6 to 18/6 IC, and for the latter from 13/ to 14/6 IC. Coke tin wasters are in fair demand at about 13/.

THE HARDWARE TRADES.

In London it is as yet too near the opening of the year to speak definitely of any alteration in the business situation, but from what I hear there is a more hopeful spirit about, and if orders are no more numerous than they were a month ago that is not considered as unsatisfactory, seeing that the first half of January is usually a quiet period. Many firms are still in the midst of stock-taking, and those who have completed the operation are too busy in settling up their books to order with any freedom. The export business, on the whole, is no worse than it was two or three weeks ago, but that is not saying much. Australia has sent some fairly good order sheets, and so has South America, for certain classes of goods, but the Eastern markets remain very unsatisfactory, and are likely to remain so until the rate of exchange takes a decidedly favorable turn.

At Birmingham the new year's business opens very quietly, but the hopeful feeling which manifested itself before Christmas is rather strengthened than otherwise by the more settled aspect of affairs abroad and the fact that in many cases last year's returns have come out better than was expected. As manufacturers' travelers have only just started on their journey home orders at present are rather meager, but London is proving a better customer in some lines than was generally expected from recent reports and experience. There are a good number of inquiries about for export, and American buyers now in this country are placing orders for guns, fancy goods, jewelry and saddlers' ironmongery with considerable freedom. The last Cape mail has brought some respectable orders, and Australian requirements are well sustained for all kinds of railway stores and material. At Wolverhampton Bayliss, Jones & Bayliss, Victoria Fencing and Engineering Works, have in hand a large contract for the Indian Government. The contract consists of work for the Indian Telegraph Department, and the iron and most of the accessories pertaining to the work will be made in the town or district. The delivery extends over the first half of this year and the value of the contract is set down at in round figures £50,000. At Sheffield the new year is scarcely sufficiently advanced to form any clear judgment of the prospects of the country trade. Travelers are only just on the road, and the business booked has chiefly come in through the medium of letter orders. Typical representatives of the home trade in cutlery, edge tools and small ware, however, are well satisfied with the indications which they have already had, and have been able to make a fair start with the new orders. The leading Bessemer steel makers have been doing considerable business at advanced rates, ranging up to a rise of 7/6, consequent on the upward turn in the quotations for hematites and spiegelisen, the deliveries in some cases extending as far into the future as six months. The export department continues to be marked by more cheerful accounts from the United States and some of the Australian colonies, while several substantial lines in high-class razors and pocket-cutlery have recently been received from India.

Latest Legal Decisions.

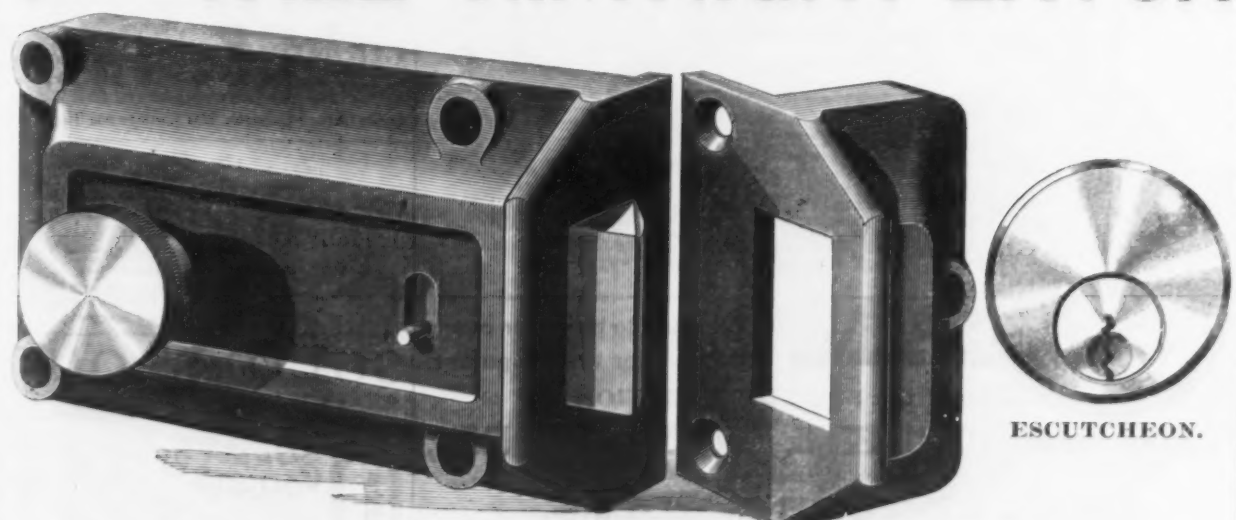
FRAUDULENT CONVEYANCES.

M., who was threatened with an attachment by C., a creditor, conveyed all of his real estate to McK., to defeat C. in getting his claim, which M. contended was unjust. The grantee in taking the deed agreed to pay C. whatever was found to be due him. Shortly after the conveyance was made M. died, and B. took out letters of administration. The creditors required the administrator to sue McK. to recover the property for their benefit, some of whose claims arose after the making of the deed. The suit was brought and the trial court rendered judgment for the administrator for the benefit of those creditors whose claims were in existence when the deed was made, but denied the right of subsequent creditors to the remedy. In this case—Bassett vs. McKenna—both sides appealed to the Supreme Court of Errors of Connecticut, where the claims of all the creditors were sustained. Judge Carpenter, in the opinion, said: "1. This conveyance was in fraud of creditors. The agreement of the grantee to pay the debt of C. did not relieve the transaction of its fraudulent character. A creditor is not bound to accept a verbal promise to pay his claim as a substitute for visible attachable property. 2. It is the duty of executors and administrators to include in the inventory of the estate the property of the decedent which he had conveyed in fraud of creditors when it is needed to pay debts. In this respect there is a close analogy between executors and administrators and trustees of insolvent estates and receivers of corporations, where we have recognized the right to recover. 3. In this case the defendant participated in the fraud, for he knew the debtor's intention, and agreed to carry it out. So, the conveyance being fraudulent and being set aside, the equities of the subsequent creditors are inferior to those of the fraudulent grantee, and they will share in the distribution of the property recovered. Where the conveyance is made in good faith, and under circumstances which show that there was no intention to defraud any creditor, there seems to be some difficulty in perceiving how the subsequent creditors can make out any right as against the voluntary grantees through the equity of the antecedent creditors; but where the conveyance is clearly fraudulent it is perfectly reasonable to hold that all of the creditors should participate in the recovery."

BANKING—FRAUD OF AGENT—STATUTE OF LIMITATIONS.

B. deposited in 1868, with the cashier of a bank, certain bonds for safe-keeping, and died in 1869. He was given a certificate of deposit. Upon the distribution of his estate in 1871 new certificates were issued to the interested parties, and H. was given one for \$2400. In 1874 H. sought to withdraw his bonds, but was told that they had been sent to Pittsburgh for safe-keeping, and repeatedly the cashier promised to get them. Interest on all of the bonds deposited was promptly paid, but in 1876 it was discovered that years before the cashier had pledged all of these bonds for a debt of the bank. H. demanded a settlement of the bank, but failed to get it, and in 1882, shortly less than six years from his discovery of the fraudulent appropriation of the bonds, he brought suit against the bank, which defended on two grounds: 1. That it was not liable for the acts of the cashier in taking the bonds and pledging them. 2. That the statute of limitations had run against the claim. The trial judge ruled in favor of the bank on the first point, and the plaintiff carried the case—Hughes vs. First National Bank of Waynesburg—to the Supreme Court of Pennsylvania, where he succeeded. Judge Paxson, in the opinion, said: "1. There may have been in the origin of the matter no liability upon the bank, for there is no trace of any authority

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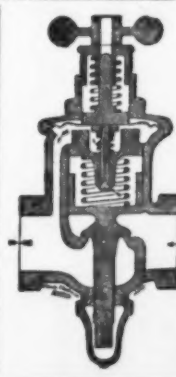
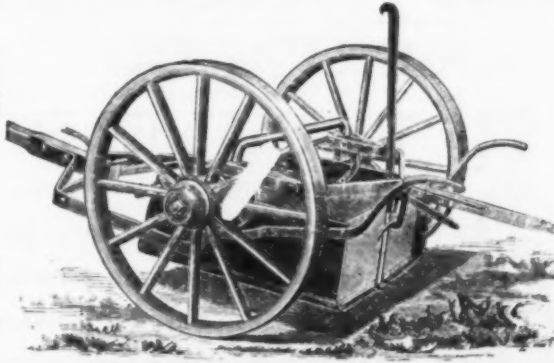
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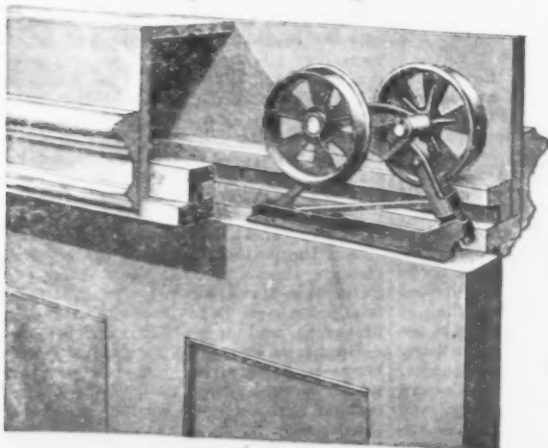
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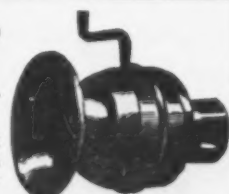
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10, 12, 14, 16 ounce. "Diamond" brand, list, Blue, 37¢; Tinned, 50¢. "Circle" brand, list, Blue,
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Merrill Brothers,
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BROOKLYN, N. Y.

**HAMMERS,
FORGINGS and
POWER PRESSES.**

from the Board of Directors to receive such deposits. But when the cashier, who had taken the bonds for safe-keeping, used them as a pledge for the debt of the bank, the matter became a transaction of the bank, the fraud of the cashier became the fraud of the bank, and the concealment of the pledge became the bank's concealment. Besides, these bonds were sold by the pledges and their proceeds were applied to the debt of the bank. The bank cannot retain the fruits of the crime of its agent and repudiate his act. No authority is needed for so plain a proposition. 2. The fraud was not discovered until 1876; it was carefully concealed until that time, and the conversion for which this action is brought was not known until then. The right to sue began then, and as the action was brought within six years from that time it was brought in time. It may be that there were circumstances of suspicion calculated to alarm a prudent man; but if this is conceded by us that does not help the bank. It cannot take advantage of its own wrong. Holding the property of the plaintiff and having fraudulently converted it to its own use and concealed the fact from him, we will not hold the plaintiff to knowledge which he did not possess."

INSURANCE—INDEMNITY—THE CONTRACT
DEFINED.
An action was brought to prevent the Farmers' and Mechanics' Mutual Benevolent Association, which had a membership entitled to a "death benefit" not to exceed \$5000, to be paid out of assessments to which there was no legal claim, this payment being voluntary, membership ceasing on the failure to pay, on the ground that the association had not complied with the insurance laws. The defense set up was that the association was not engaged in insurance. In this case—State vs. Farmers' and Mechanics' Mutual Benevolent Association—the Supreme Court of Nebraska decided against the association. Judge Reese, in the opinion, said: "A contract by which one party, for a consideration, promises to make a certain payment of money upon the destruction or injury of something in which the other party has an interest, is a contract of insurance, whatever may be the terms of payment of the consideration or the mode of estimating and securing the loss, and although the object of the insurer in making the contract is benevolent and not speculative."

PARTNERSHIP.
Thompson and two others, in 1857, became partners under the name of Davey, Thompson & Adler, and in 1881, the term running out, a fresh agreement on like terms was entered into. In the following year Thompson became heavily indebted to a savings bank, and its trustee recovered against him a judgment of \$26,000 and interest, and issued a writ of *elegit* under which possession was taken of one of the places of business of the firm for the purpose of realizing the share of Thompson in the firm business. Thompson thereupon mortgaged his interest in the partnership to secure the judgment, and the sheriff was withdrawn from possession. Eighteen months later the firm was dissolved, and a month afterward Thompson was adjudicated a bankrupt. The mortgagees then issued their writ and the question arose: From what time were the plaintiffs entitled to an account of the partnership assets and property as against the other partners? The plaintiffs claimed at least from the date of the mortgage, and the partners contended that the date of this writ was the proper time. In this case—Whetham vs. Davey—in the English Chancery Division, Judge North ordered that the account be taken from the date of the dissolution. "If there had been no dissolution, I should have ordered the account to be taken from the date of the writ. It seems to me to be impossible that the account should be taken before the plaintiffs became assignees, as is claimed for them. Partnership accounts are sometimes settled for years, and the assignee cannot be allowed to disturb any settled account."

The Production of Pig Iron in the United States in 1885.

The American Iron and Steel Association have just completed their returns of the production of pig iron. The following tables give the returns in detail:

Production According to Fuel Used.

Fuel used.	Production, Tons of 2000 lbs. (Includes spiegeleisen.)		
	First half of 1885.	Second half of 1885.	Total 1885.
Anthracite.....	703,217	751,173	1,454,390
Charcoal.....	180,291	213,553	393,844
Bituminous.....	1,361,308	1,414,327	2,775,635
Total.....	2,150,816	2,379,053	4,529,869

Production of Pig Iron in Certain Districts.

District.	Production, Tons of 2000 lbs.		
	First half of 1885.	Second half of 1885.	Total 1885.
Lehigh Valley.....	223,056	250,307	473,363
Schenectady Val.....	104,196	100,715	204,911
U. Susquehanna.....	62,705	64,573	127,278
L. Susquehanna.....	217,490	211,075	428,565
Shen. Valley.....	101,514	105,481	206,995
Allegheny Co.....	277,940	307,756	585,696
Mis. bituminous.....	176,344	229,065	405,409
Charcoal.....	4,980	8,008	12,988
H. R. bit.....	28,692	49,145	77,837
Mahoning Val.....	120,696	115,392	236,088
Hocking Val.....	16,052	34,429	50,481
Mis. bituminous.....	97,550	82,590	180,140
H. R. charcoal.....	10,961	7,957	18,918
Mis. charcoal.....			

PRODUCTION OF ALL KINDS OF PIG IRON BY STATES.

Production of Bituminous Coal and Coke Pig Iron.

States.	Production, Tons of 2000 lbs.		
	First half of 1885.	Second half of 1885.	Total 1885.
Pennsylvania.....	555,798	642,302	1,198,100
Maryland.....	2,022	4,245	6,267
Georgia.....	21,781	79,458	101,239
Alabama.....	7,000	30,127	37,127
West Virginia.....	35,965	33,045	69,010
Kentucky.....	15,098	17,178	32,276
Tennessee.....	62,734	64,292	127,026
Ohio.....	392,950	272,945	665,895
Indiana.....	3,594	8,040	11,634
Illinois.....	141,475	186,501	327,976
Michigan.....		5,000	5,000
Wisconsin.....	6,358	23,295	29,653
Colorado.....	5,481		5,481
Total, 1885.....	1,261,308	1,414,327	2,675,635
Total, 1884.....	1,229,289	1,314,813	2,544,102

Production of Charcoal Pig Iron.

States.	Production, Tons of 2000 lbs.		
	First half of 1885.	Second half of 1885.	Total 1885.
Maine.....		440	440
Massachusetts.....		800	800
Connecticut.....	7,017	10,483	17,500
New York.....	7,965	6,717	14,682
Pennsylvania.....	4,080	8,008	12,088
Maryland.....	5,761	1,671	7,432
Virginia.....	2,806	9,752	12,558
North Carolina.....	820	970	1,790
Georgia.....	644	5,153	5,797
Alabama.....	31,304	46,289	77,593
Texas.....	1,000	843	1,843
West Virginia.....			
Kentucky.....	1,100	3,607	4,707
Tennessee.....	13,410	17,763	31,173
Ohio.....	10,061	7,957	18,018
Michigan.....	66,557	76,504	143,061
Wisconsin.....	17,867	1,702	19,569
Missouri.....	12,147	9,638	21,785
Minnesota.....			
Oregon.....	1,905	8,027	9,932
California.....	1,857		1,857
Washington Territory.....			
Total, 1885.....	180,291	213,553	393,844
Total, 1884.....	205,371	251,047	456,418

Production of Anthracite Pig Iron.

States.	Production, Tons of 2000 lbs.		
	First half of 1885.	Second half of 1885.	Total 1885.
New York.....	67,228	78,249	145,477
New Jersey.....	28,014	45,653	73,667
Pennsylvania.....	607,957	727,371	1,335,328
Maryland.....			
Total, 1885.....	703,217	751,173	1,454,390
Total, 1884.....	631,721	754,732	1,386,453

Total Production of Pig Iron.

States.	Production, Tons of 2000 lbs. (Includes spiegeleisen.)		
	First half of 1885.	Second half of 1885.	Total 1885.
Maine.....		440	440
Massachusetts.....		800	800
Connecticut.....	7,017	10,483	17,500
New York.....	75,191	84,066	159,257
New Jersey.....	28,014	45,653	73,667
Pennsylvania.....	1,167,875	1,277,641	2,445,516
Maryland.....	8,393	8,016	16,409
Virginia.....	74,627	89,155	163,782
North Carolina.....	820	970	1,790
Georgia.....	7,944	25,340	33,284
Alabama.....	118,195	159,252	277,447
Texas.....	1,000	843	1,843
West Virginia.....	35,965	33,045	69,010
Kentucky.....	10,768	20,755	31,523
Tennessee.....	73,141	82,055	155,196
Ohio.....	273,020	290,473	563,493
Indiana.....	3,594	8,040	11,634
Illinois.....	141,475	186,501	327,976
Michigan.....	66,557	76,504	143,061
Wisconsin.....	17,867	6,705	24,572
Missouri.....	18,543	32,303	50,846
Minnesota.....			
Colorado.....	5,481		5,481
Oregon.....	1,805	2,027	3,832
California.....			
Washington Territory.....			
Total, 1885.....	2,150,816	2,379,053	4,529,869
Total, 1884.....	2,007,021	2,322,592	4,329,613

STOCKS OF ALL KINDS OF PIG IRON ON DECEMBER 31, 1885, DECEMBER 31, 1884, AND JUNE 30 AND DECEMBER 31, 1885.

Total Stocks of Unsold Pig Iron.

States.	Tons of 2000 lbs.			
	Dec. 31, 1883.	Dec. 31, 1884.	June 30, 1885.	Dec. 31, 1885.
New England.....	12,437	11,433	8,222	8,997
New York.....	65,301	69,347	47,242	32,796
New Jersey.....	25,615	11,809	10,300	4,120
Pennsylvania.....	195,804	221,849	257,359	117,299
Maryland.....	10,866	7,637	8,094	10,145
Va., N. C. and Ga.....	30,601	41,226	37,725	31,811
Alabama.....	9,531	21,436	31,399	17,633
West Virginia.....	1,800	1,108	5,399	4,340
Tennessee.....	8,319	9,754	10,150	5,819
Ohio.....	30,447	29,340	34,901	18,067
Mich. & Indiana.....	73,136	53,058	99,947	39,946
Illinois.....	36,405	69,715	69,068	66,479
Wisconsin.....	4,381	5,200	5,300	5,300
Missouri.....	6,340	7,300	13,154	4,425
Pacific States.....	21,641	37,598	48,175	28,068
Total.....	533,800	593,000	692,016	419,512

Stocks of Unsold Anthracite Pig Iron.

States.	Tons of 2000 lbs.			
	Dec. 31, 1883.	Dec. 31, 1884.	June 30, 1885.	Dec. 31, 1885.
New York.....	49,094	51,921	30,805	16,257
New Jersey.....	25,615	11,809	10,300	4,120
Pennsylvania.....	99,211	119,339	96,530	49,795
Maryland.....	4,500	1,343	1,000	1,000
Total.....	178,420	173,369	138,535	69,172

Stocks of Unsold Charcoal Pig Iron.

States.	Tons of 2000 lbs.			
	Dec. 31, 1883.	Dec. 31, 1884.	June 30, 1885.	Dec. 31, 1885.
New England.....	12,437	11,433	8,222	8,997
New York.....	17,267	17,426	16,467	17,559
New Jersey.....	11,330	14,257	10,150	17,452
Pennsylvania.....	6,359	5,734	6,904	8,750
Va., N. C. and Ga.....	14,434	39,326	18,965	25,510
Alabama.....	6,731	10,500	18,011	10,319
West Virginia.....	6,917	5,521	5,000	4,319
Tennessee.....	18,061	19,448	30,282	17,967
Ohio.....	25,221	19,441	28,896	21,412
Mich. & Indiana.....	35,078	60,715	69,068	67,779
Illinois.....	6,340	7,300	13,154	4,425
Wisconsin.....	17,291	24,328	34,545	29,373
Missouri.....	5,327	5,224	5,708	5,707
Pacific States.....				
Total.....	183,978	222,162	218,070	232,332

Pennsylvania.....	85,257	93,622	145,951	56,502
Maryland.....		560	900	376
Virginia.....	14,497	19,650	23,227	7,751
Ala. and Georgia.....	4,540	11,796	14,008	8,215
West Virginia.....		1,159	5,649	4,000
Kentucky.....	1,300	4,000	5,150	1,500
Tennessee.....	11,996	9,792	14,698	700
Ohio.....	47,915	35,357	76,111	18,554
Indiana.....	727			700
Illinois and Wis.....		4,300	5,905	8,351
Missouri.....	8,750	19,240	19,551	8,665
Total.....	171,882	191,445	306,251	115,982

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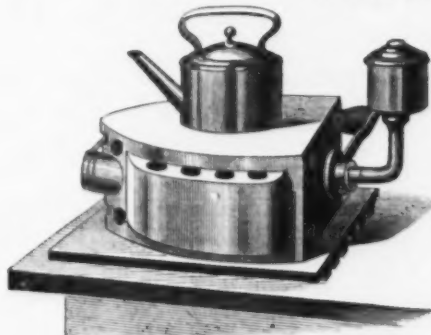
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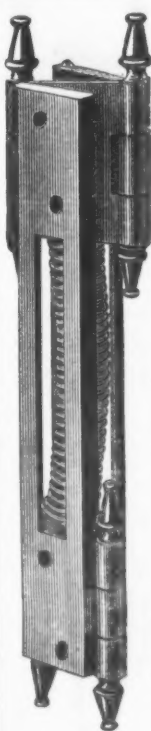
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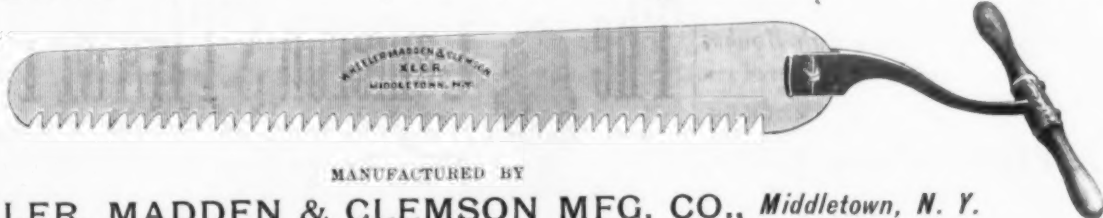
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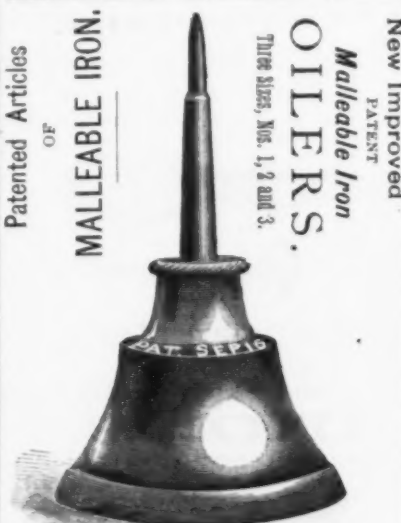


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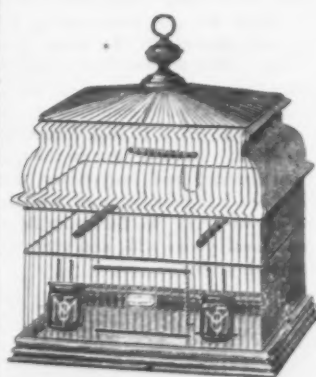


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Bills Before the Ways and Means Committee.

The following bills and concurrent resolutions affecting trade and commerce have been referred to the Committee on Ways and Means:

By Mr. Reid, of North Carolina: To repeal the duty on steel rails, sugar, molasses and salt.

By Mr. Dockey, of Missouri: To exempt from customs duties all timber and lumber used in the construction of houses, fences, ships, steam vessels, barges and other boats.

By Mr. Hewitt, of New York: Amendment of Title 48, Revised Statutes, so as to authorize the purchase of foreign-built ships by citizens of the United States for use in the foreign carrying trade.

By Mr. Nelson, of Minnesota: To place hemp, manila, sisal grass, and all thread, twine, rope and cordage from the same, on the free list.

By Mr. Eldridge, of Michigan: To put all kinds of lumber on the free list.

By Mr. Mayburg, of Michigan: To provide for the entry of ores of iron, lead, copper, zinc, bituminous coal, salt and lumber free of customs duties.

By Mr. Johnston, of North Carolina: To admit salt free of duty.

By Mr. Reagan, of Texas: To allow the purchase and register of foreign-built ships by citizens of the United States.

By Mr. Hatch, of Missouri: To provide for the importation of salt free of duty.

By Mr. Dunn, of Arkansas: To authorize the purchase of foreign-built ships by citizens of the United States for use in the foreign carrying trade.

By Mr. Mayburg, of Michigan: To admit lumber of all descriptions into the Territories of the United States free of customs duties.

By Mr. Mayburg, of Michigan: A joint resolution for renewal of commercial relations with the British Possessions in North America.

By Mr. Townsend, of Illinois: A joint resolution requesting the President to invite the co-operation of the Governments of American nations in securing the establishment of free commercial intercourse among those nations and an American customs union.

By Mr. Collins, of Massachusetts: To remove certain burdens on the American merchant marine.

By Mr. Blanchard, of Louisiana: To admit certain machinery free of duty.

BILLS FAVORABLE TO AMERICAN INTERESTS.

By Mr. Ezra B. Taylor, of Ohio: To restore the rates of duty on imported wool.

By Mr. O'Donnell, of Michigan: To repeal the duty on sugar, and provide for the payment of a bounty for the cultivation of sugar in the United States of America.

By General Slegley: To authorize the manufacture of steel suitable for heavy ordnance, armor and other army and navy purposes.

By Mr. Fendley, of Maryland: A resolution of investigation as to the cause of the decline of American coopers interests, and of our timber and shipping interests connected therewith in the trade with Cuba.

By Mr. Hires, of New Jersey: For the protection of the fisheries on the Atlantic Coast.

By Mr. Buck, of Connecticut: Relating to duties on tobacco.

By Mr. Dingley, of Maine: To inquire into what, if any, legislation will promote the interests of the American marine engaged in the fisheries.

By Mr. Guenther, of Wisconsin: To prohibit the importation of articles of foreign manufacture bearing a stamp, mark or imprint conveying the impression that such articles are of American manufacture.

By Mr. Barrows, of Michigan: To regulate the rates of duty on wool.

By Mr. Hiestand, of Pennsylvania: To regulate the duties on leaf tobacco.

By Mr. Casewell and Mr. La Follette, of Wisconsin: To regulate the duties on tobacco.

By Mr. McKenna, of California: To exempt the importation of beet-sugar machinery from duty for a limited time.

By Mr. Wise, of Vermont: To authorize the establishment of export tobacco manufacturers, and for drawback upon imported articles used in manufacturing exported tobacco.

Remonstrances of fishermen, owners of fishing vessels and others interested in the fishing business of Chatham, Orleans, Wellfleet, Truro, Sandwich and Broomtown, Mass., against the appointment of an International Fisheries Commission.

The Demand for Car Lumber.

In corroboration of the statement, repeatedly made, that there is a growing demand for iron on the part of car-builders, we quote the following from the *Northwestern Lumberman*, as pointing in the same direction:

"The feature of trade now interesting the dealers is the lively inquiry for car stuff and the apparent scarcity of it. In the matter of Norway car-sills there seem to be fairly lively doings. Buyers are picking up all they can find and at greatly advanced prices. Stuff that sold a short time ago at \$14.50 a thousand has lately changed hands at \$19, and it is insisted that good Norway car-sills are worth \$20 a thousand. This up-jump in prices has resulted in increased demand consequent on the revival of car-building. Nearly every factory now has orders to fill and more in prospect. The demand has come so suddenly that the Michigan mills were unprepared for it, and are now not equal to the emergency. Buyers are resorting to the wholesale yards here for what they cannot procure at the mills. What is characteristic of the demand for car-sills is also in a measure peculiar to car siding and decking just now. There is a brisk inquiry all over the district for both soft and Norway pine strips for car-building. A and B flooring in white pine are the grades mostly used in car construction. The stuff required is, however, short lumber, 5 and 8 feet long, mostly the former. The stock has already been so nearly bought up that cutting of longer lengths will have to be resorted to, which will tend to still further stiffen prices, which are already on the advance. It is claimed

that short stuff is now worth \$2 a thousand more than it was before the new demand sprung up."

The Rise and Fall of Prices.

The following highly interesting tables from the report of Mint Director Kimball on the production of the precious metals in the United States for 1885, exhibit the rise and fall in prices of the principal commodities in the New York market, with an average of the whole period between 1845 and 1880, and then compare with this average the prices of 1882 and the three subsequent years:

Average Prices in New York.

	For the six-year period 1845-1850	For the year 1882	For the year 1883	For the year 1884	For the year 1885
Flour, super., bbl.	\$5.49	\$3.98	\$3.10	\$2.89	\$3.35
Rye flour, bbl.	3.50	3.24	3.73	2.61	3.77
Corn meal, bbl.	3.20	3.08	2.62	3.08	3.00
Wheat, N.Y. bu.	1.16	1.27	1.26	1.01	.99
Rye, bush.	.73	.82	.70	.61	.69
Oats, bush.	.46	.52	.40	.38	.36
Corn, bush.	.62	.76	.64	.01	.58
Coal, anth., ton.	5.45	4.35	3.50	4.10	3.85
Coffee-Rio, lb.	.64	.68	.64	.60	.60
Java, lb.	.08	.10	.12	.12	.12
Copper-Pig, lb.	.17	.18	.16	.14	.14
Sheathing, lb.	.23	.20	.24	.20	.19
Cotton, upland lb.	.08	.11	.10	.10	.08
Fish-Cod, cwt.	2.81	6.54	6.31	5.27	4.74
Mackerel, bbl.	10.10	18.70	17.32	21.31	20.41
Hops, lb.	.12	.45	.20	.24	.14
Iron, Scotch, ton.	31.67	26.73	21.00	21.61	20.40
Lead, pig, cwt.	4.21	4.96	4.31	3.22	3.25
Leather, lb.	.17	.25	.22	.17	.21
Molasses, N.O. gal.	.28	.36	.29	.31	.27
Nails, cut, lb.	.04	.04	.03	.03	.02
Wrought, lb.	.10	.08	.05	.05	.05
Naval stores-Turpentine, gall.	.36	.51	.48	.34	.34
Rosin, bbl.	.82	2.15	1.62	1.31	1.17
Paint-red lead, cwt.	5.70	6.30	5.80	5.70	5.40
Pork, mess, bbl.	11.49	17.00	16.00	16.36	11.65
Prime, bbl.	9.29	14.50	14.50	14.81	10.07
Hams, lb.	.08	.10	.09	.11	.10
Lard, lb.	.07	.12	.10	.08	.08
Rice, cwt.	3.45	5.00	6.00	6.10	5.34
Salt, Liv'p'l, sack.	1.32	.70	.71	.70	.72
Sugar, Cuba, lb.	.07	.07	.08	.05	.05
Loaf, lb.	.07	.09	.09	.07	.09
Tallow, American, lb.	.07	.08	.07	.07	.06
Tobacco, man'd, lb.	.14	.17	.18	.21	.15
Wool, common, lb.	.24	.36	.32	.33	.34
Merino, lb.	.35	.45	.40	.40	.40
Pulled, lb.	.27	.36	.31	.28	.28

Comparison of Prices of 1881 and Subsequent Years with the Average Prices of 1845-50, Expressed in 1000.

	For the year 1881	For the year 1882	For the year 1883	For the year 1884	For the year 1885
Flour-super., bbl.	\$4.14	\$2.98	\$2.65	\$2.25	\$2.88
Rye flour, bbl.	.80	.90	.77	.74	1.02
Wheat, N.Y. bu.	1.10	1.04	1.03	.87	.81
Rye, bush.	1.36	1.15	.94	.91	.96
Oats, bush.	1.13	1.22	1.30	.85	.78
Corn, bush.	.94	1.37	.97	.93	.78
Coal, anth., ton.	.71	.79	.76	.73	.70
Coffee-Rio, lb.	1.58	1.34	1.05	1.43	1.27
Java, lb.	2.04	1.62	1.51	1.98	1.56
Copper-Pig, lb.	1.00	1.61	1.02	.81	.69
Sheathing, lb.	1.11	1.25	1.07	.86	.72
Cotton, upland lb.	1.39	1.46	1.28	1.26	.97
Fish-Cod, cwt.	1.91	2.36	2.14	1.84	1.69
Mackerel, bbl.	1.14	1.76	1.50	2.07	1.90
Hops, lb.	1.67	3.16	1.48	2.02	1.17
Iron, Scotch, ton.	.76	.81	.72	.66	.64
Lead, pig, cwt.	1.12	1.76	1.02	.96	.61
Leather, lb.	1.52	1.61	1.57	1.61	1.53
Molasses, N.O. gal.	1.04	2.00	1.93	1.82	1.84
Nails-Cut, lb.	.89	.93	.80	.84	.51
Wrought, lb.	.47	.51	.50	.40	.37
Naval stores-Turpentine, gall.	1.24	1.47	1.19	.86	.97
Rosin, bbl.	2.44	2.54	1.51	1.64	1.97
Paint-red lead, cwt.	1.06	1.88	1.02	.94	.94
Pork-Mess, bbl.	1.54	1.92	1.51	1.43	1.03
Prime, bbl.	1.66	1.51	1.54	1.57	1.84
Hams, lb.	1.31	1.67	1.65	1.59	1.26
Lard, lb.	1.64	1.69	1.50	1.17	.92
Rice, cwt.	1.73	1.64	1.37	1.71	1.54
Salt, Liv'p'l, sack.	.51	.51	.52	.51	.51
Sugar-Cuba, lb.	1.09	1.04	.94	.79	.76
Loaf, lb.	1.31	1.02	.98	.73	.71
Tallow, American, lb.	.93	1.10	1.00	.94	.74
Tobacco, man'd, lb.	1.35	1.22	1.20	1.48	1.26
Wool, common, lb.	1.05	1.17	1.02	.97	1.52
Merino, lb.	1.57	1.22	1.24	1.12	.74
Pulled, lb.	1.35	1.34	1.36	1.31	1.09
Average...	1.28	1.31	1.38	1.11	1.00

Average, exclusive of copper, the recent decline of which is believed to be mainly a result of increased production.

Heavy Locomotives and Bridges.

Commenting on a heavy locomotive built recently for the Calumet and Hecla Mining Co., on the designs of Dr. Leavitt, the consulting engineer of that company, the *Railroad Gazette* says: "The general fact that it is getting to be no unfrequent occurrence for engines heavier than are stipulated for in any bridge specifications to be turned out for regular service is a significant one, deserving of more attention than it seems to get. This increase in weight and power is no doubt in the direction of economy up to the point where the rails can sustain it, and rails are now being produced so cheaply, and there is so much use for old rails for extensions of both side tracks and main tracks, that any necessary increase in weight of rails will not, and probably ought not to, impede the use of as heavy locomotives as may seem in themselves economical. But the bridges are a more permanent and more serious matter, and whether the railroads are not laying up for themselves a stock of future trouble and expense by permitting bridges to be put in which are barely adequate to sustain the maximum of present practice, merely to save the small sum which it would cost to make them 10 per cent. heavier, may well be questioned. Not only the total load per wheel base, but the total load per axle, are now in regular practice of some roads larger than any bridge specifications allow for."

The mine operators at the scene of the recent disaster in Nanticoke, Pa., contemplate drilling a 3-inch hole to the workings, where it is possible the imprisoned miners may still be alive, in order that food may be supplied until the relief party shall have worked its way to the fatal spot. The depth is 280 feet, of which 200 is through solid rock.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, January 28, 1886.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. BAYLES, Editor.
JOHN S. KING, Business Manager.
CHAS. KIRCHHOFF, Jr., Associate Editor.

RATES OF SUBSCRIPTION, INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND
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Weekly Edition.....\$4.50 a year.
Issued every THURSDAY morning.

Semi-Monthly Edition.....\$2.30 a year.
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Monthly Edition.....\$1.15 a year.
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should be made by draft, payable to the order of David Williams on any banking house in the United States or Europe; or, when a draft cannot be obtained in postage stamps of any country.

NEWSDEALERS OR BOOKSELLERS

In any part of the world may obtain *The Iron Age* through the American News Company, New York, U. S. A.; the International News Company, New York, U. S. A.; and London, England; or the San Francisco News Company, San Francisco, Cal., U. S. A.

RATES OF ADVERTISING.

One square (12 lines, one inch), one insertion, \$2.50; one month, \$7.50; three months, \$15.00; six months, \$25.00; one year, \$40.00; payable in advance.

BRITISH AGENCY.

Office of THE IRONMONGER, 42 Cannon St., London.

DAVID WILLIAMS, Publisher.

66 and 68 Duane Street, New York.

PITTSBURGH.....77 Fourth Avenue.
Jos. D. Weeks, Manager and Associate Editor.

PHILADELPHIA.....230 South Fourth Street.
Tos. Hobson, Manager.

CHICAGO.....36 and 38 Clark St., cor. Lake.
J. K. Hanes, Manager.

CINCINNATI.....13 West Third Street.
HENRY SMITH, Manager.

CHATTANOOGA.....Ninth and Carter Streets.
S. B. Lowe, Manager.

REMOVAL.

The office of this journal is removed to 66 and 68 Duane Street.

The Production of Pig Iron in 1885.

The American Iron and Steel Association has accomplished a feat unparalleled in the history of industrial statistics by issuing in the third week of January complete returns of the production and stocks of pig iron, and its officers are to be heartily congratulated. Of course such prompt work is impossible without the co-operation of producers, but the credit of so deeply interesting them that they respond immediately is certainly due to those who manage the work. When the distances are taken into consideration, and allowance is made for the delay incident to interruptions of postal communication at the present season, it will be readily conceded that the rapidity of the work is almost marvelous. The trade will appreciate this, since its interest in statistics decreases very rapidly with every day's delay. The array of tables, which we print elsewhere in full, will be widely quoted as one of the most convincing and striking proofs of the sound condition of our pig-iron industry. It was quite generally understood that our make had been quite heavy during 1885, and in fact Mr. Swank only recently estimated that it would closely approach that of 1884. The complete figures now show that the production was only 59,744 net tons less than 1884, while the apparent consumption of domestic iron was, in consequence of a decrease of stocks by 176,488 tons, a little greater than in 1884, when some stocks accumulated. This state of affairs is due entirely to the greater activity during the second half of the year, as is evidenced by the increase of the production in that period over the first six months of the year. On June 30, 1885, stocks had increased by 100,000 tons, although the production of the first six months was only 2,150,816. That accumulation was swept away, and an inroad into stocks was made to the extent of 176,000 tons more, although the output had been 2,379,053 net tons for the second half of the year. In other words, the apparent consumption of domestic pig in the first six months of 1885 was 2,050,900 tons, while in the second half of that year it was 2,655,457 tons, or a gain of, roughly, 600,000 net tons. This is certainly an exceedingly favorable

showing, and if the rate of consumption now reached is maintained during the current year 1886 will witness the greatest record of home production, providing the imports of foreign pig can be kept at the present rate. As compared with recent years, commencing with the boom year 1880, the production of pig iron in 1885 presents an exceedingly favorable showing when the depression in all branches of business in the greater part of 1885 is considered. The figures are as follows:

Years.	Net tons.	Gross tons.
1880.....	4,385,414	3,835,191
1881.....	4,641,564	4,144,254
1882.....	5,178,122	4,623,323
1883.....	5,146,973	4,595,510
1884.....	4,589,613	4,097,968
1885.....	4,589,959	4,044,596

The production of pig iron in 1885, classified according to the character of the fuel used, is given in one of the tables. As compared with 1883 and 1884 it was as follows, in net tons:

Fuel used.	1883.	1884.	1885.
Bituminous.....	2,689,650	2,544,742	2,675,685
Anthracite.....	1,865,506	1,586,453	1,454,300
Charcoal.....	571,720	458,418	399,544
Total.....	5,146,972	4,589,613	4,529,529

In the analysis accompanying the tables we find the following remarks, which will be read with interest: "The anthracite figures require to be accompanied by the explanation that nearly all of the pig iron that has in late years been produced in anthracite furnaces has really been made with a mixture of anthracite and coke, very little being made with anthracite alone. In 1884 only 246,570 net tons were produced with anthracite alone, and in 1885 only 277,913 net tons were produced. In each year we produced very much less pig iron with anthracite alone than with charcoal, although in both years the production of charcoal pig iron sensibly declined as compared with 1883 and other years back to 1880."

The anthracite furnaces have lost ground relatively in 1885, the principal decline being in Pennsylvania in the Schuylkill and in the Upper Susquehanna valleys, as the following figures will show:

Year.	Lehigh.	Schuylkill.	Upper Susquehanna.	Lower Susquehanna.
1879.....	449,663	292,235	127,990	159,305
1880.....	280,850	123,184	71,781	79,717
1881.....	544,967	306,026	168,128	217,869
1882.....	560,190	306,049	129,785	218,229
1883.....	609,328	342,701	201,367	300,240
1884.....	575,967	337,433	165,629	337,419
1885.....	481,867	278,578	148,352	419,430
1886.....	473,963	304,841	127,278	429,166

The steady gain of the Lower Susquehanna Valley since 1875 must be specially noted. New York contributed to the anthracite pig iron tonnage 215,998 tons in 1884. It dropped to 145,475 tons in 1885. New Jersey, too, exhibits a decrease from 82,935 net tons to 73,667 net tons in 1885.

In pig iron produced with bituminous coal or coke Pennsylvania shows an improvement from 1,084,011 net tons in 1884 to 1,198,100 net tons in 1885. This increase is nearly entirely due to the greater quantity made in the Pittsburgh district, Allegheny County, which was carried from 487,055 net tons in 1884 to 585,696 tons in 1885, or within a few thousand tons of its best record, in 1883—592,475 net tons. The Shenango Valley has fallen off from 246,086 to 206,995 net tons in 1884, while the furnaces grouped under "Miscellaneous Bituminous Furnaces" in Pennsylvania have increased from 350,870 net tons to 405,409 net tons. In Ohio the Mahoning Valley bituminous furnaces produced only 236,078 tons in 1885, against 246,288 tons in 1884, while the Hocking Valley, which had fallen so far behind in 1884, recovered from 24,126 tons then to 50,481 tons in 1885. Hanging Rock remained about the same, 64,781 and 68,837 tons respectively. Illinois maintained the high position gained in 1884.

The South has again recorded considerable progress in 1885, and has reached a higher point than even in 1883. The following are the amounts in net tons:

States.	1881.	1882.	1883.	1884.	1885.
Alabama.....	98,093	112,765	172,465	189,664	227,488
Virginia.....	83,711	87,791	132,907	157,488	163,782
Tennessee.....	87,406	137,002	133,903	134,267	69,007
West Virginia.....	60,499	73,230	88,388	55,221	161,199
Kentucky.....	45,973	66,522	54,629	45,052	37,533
Georgia.....	31,404	42,440	45,864	42,655	32,924
Maryland.....	48,756	54,524	49,153	37,342	17,299
Texas.....	3,000	1,281	2,381	5,140	1,848
North Carolina.....	800	1,150	.....	435	1,790
Total.....	471,540	577,275	699,260	657,599	712,835

This increase has taken place almost entirely in the furnaces using bituminous coal or coke as a fuel. We give below the figures for the years 1884 and 1885, in net tons:

States.	1884.	1885.
Alabama.....	190,216	149,865
Virginia.....	142,054	151,124
West Virginia.....	55,231	69,007
Tennessee.....	115,791	130,026
Georgia.....	33,040	27,127
Kentucky.....	87,170	32,846
Maryland.....	2,963	6,767
Total.....	517,007	506,972

The charcoal furnaces again show a decline for the whole country, although some Southern States have made an advance. Alabama, which produced 59,448 net tons in 1884, rose to 77,573 tons in 1885. Tennessee, which was eighth in the list in 1884 with 18,806 tons, is now third with 31,173 tons. Connecticut came up from 14,174 to 17,500 tons, but, on the other hand, Massachusetts declined from 4902 to 869 tons. Michigan fell off from 172,834 tons to 143,121 tons. Missouri from 31,553 to 21,785 tons. Pennsylvania from 23,555 to 12,143 net tons. Wisconsin, Ohio, New York, Maryland and Virginia all lost ground. The large amount of car-wheel work in sight for the coming

change of gauge of the Southern roads will do much to restore this drooping industry to prosperity.

The most encouraging feature in the statement issued by the American Iron and Steel Association is that of pig iron unsold, in the hands of manufacturers or their agents, not required for the consumption of those who produced it. At the average rate of consumption during the whole of the year the anthracite furnaces carry about two to three weeks' stock, while that of the bituminous furnaces is equivalent to a consumption of about the same period. Of course iron will accumulate during the next few weeks, but it will be readily seen that producers are in the most excellent position to face the future calmly, and need not be discouraged by any temporary lull. The Scotch iron trade is to-day carrying more than double as much stock as we are in the entire country. More than half of what we have is charcoal iron, which needs be held in larger quantity because a good deal of it is piled away in inaccessible localities. Taken all in all, we question whether a stronger position statically for the producers of pig iron could well be imagined. We know that for certain purposes—for instance, for rails and cars—the demand in 1886 is going to be greater than it was in 1885, and we have every indication of larger buying in other lines, so that the future is a bright one, comparatively speaking.

The Tax on Commercial Travelers.

Through a decision rendered a week ago by the United States Supreme Court an abuse of long standing has again been prominently brought before business men generally. The scope of the decision referred to has been widely misunderstood. When first announced it was thought to meet the hopes of many. Later advice indicate that these hopes are far from being realized, and that vigorous agitation is still necessary before remedial measures can be finally carried through. In a good many States local laws provide for the issue of a license to commercial travelers not residents of the State. The justice of such a tax has been repeatedly assailed, and only a year ago the United States Supreme Court decided, in the case of Ward vs. Maryland, that the requirement of the State law that non-residents should take out a license, paying therefor an amount double that required from resident traders, was a discriminating tax upon non-resident traders, and that it was repugnant to the Federal Constitution. The decision just given is somewhat different in its scope. It is the case of S. A. Walling vs. the people of the State of Michigan. Walling, a traveling salesman representing the firm of Cavanaugh & Co., of Chicago, was prosecuted in the police court of Grand Rapids for selling liquor at wholesale without a license. He was convicted, and, appealing to the County Circuit Court, was again found guilty. The case was carried up to the Supreme Court of Michigan and was again decided against Walling. The judgment of this court was reversed by the Supreme Court of the United States, on the ground that the local act "operates as a regulation of commerce among the States in a matter within the exclusive power of Congress, and that it is for this reason repugnant to the Constitution of the United States and void." The ground taken by this, the latest decision, is that, while a tax of the kind under consideration may be sustained as an exercise of police power by the State, it must not discriminate against the citizens and products of other States, and that when such an element of discrimination is embodied in such local legislation it is invalid.

The soundness of this view will not, we presume, be questioned, however opinions may differ concerning the expediency or necessity of measures to aid resident traders. The difficulty lies in carrying into effect the principles thus laid down. The first step would be the passage of a law by Congress, and efforts in that direction have not been wanting. Prominent among them is the bill introduced by the Hon. Darwin R. James, of Brooklyn, which is as follows: "Residents of each State and Territory may, within the other States and Territories and within the District of Columbia, solicit from dealers or merchants orders for goods and merchandise by sample, catalogue, card, price list, description or other representation, without payment of any license or mercantile tax." This bill has received the indorsement of the Traders and Travelers' Union, of this city, who have circulated a petition in its favor. In the short time that has elapsed since the petitions were sent out the union have received signatures from 2338 New York firms, employing 13,260 traveling salesmen; 535 Boston firms, with 3247 salesmen; Philadelphia, 473 firms, employing 3100 salesmen; Baltimore, 339 firms and 1950 salesmen; Chicago, 397 firms and 3206 salesmen, and New Orleans, 131 firms and 433 salesmen; a total of 4213 firms, employing 25,226 travelers. The petitions are now being signed in St. Louis, Cincinnati, Richmond, Louisville and other business centers, and by February 1 it is expected the petition to be sent to Congress will bear the signatures of 10,000 firms, who give employment to 50,000 travelers.

It will be observed that the bill goes even a step further than the position taken in the decisions of the Supreme Court would appear to warrant. In practice the local tax on commercial travelers operates very irregu-

larly. A good many devices have been developed to evade it, and in some cases successfully. In some lines of business where few or no samples are needed, non-resident salesmen generally escape free with the connivance and aid of local merchants and dealers. In other departments where bulky samples must be carried it becomes a more difficult matter, and in these lines of business the chief sufferers are to be found. The reform is one which business men will heartily favor, and if a vigorous and determined effort is made it is possible to carry it through to a successful issue.

Manufacturers and the Tariff.

In referring to the joy of the free traders over the fact that a hardware manufacturer and a ship builder were present at the Chicago Free Trade Convention, one of our prominent journals very tersely says: "The tariff was not passed for the benefit of the manufacturers, but for that of the nation." There is a truth in this statement that is almost always overlooked. It is assumed, not only by those who have given but little attention to the tariff, but by all free traders and many who, on the whole, have a very good knowledge of the theory of protection, that it is the manufacturer who is benefited by a tariff. While it is true that a protective duty temporarily benefits the manufacturer, it is not true that it is in the long run a benefit to him, but quite the contrary. The argument of the protectionists who discussed the tariff in Congress more than 40 years ago was that it was the nation—the agriculturists, the workingmen—who were benefited by the adoption of protective duties; that the competition which these duties would engender would very shortly more than do away with all the benefit that protection would bring, and the reduction in prices which would follow this competition would inure to the benefit of the consumer—that is, the nation.

It should once for all be understood that the manufacturers of this country are not the beneficiaries of our system of protective tariff, and they are not to-day the parties most earnestly in favor of its continuance. Indeed it is a well-known fact that many manufacturers whose works and business are well established, while they would not engage in any attempt to reduce tariff duties, and probably would join a movement to prevent reduction, would at the same time not regard themselves as seriously injured should such a reduction take place, and the cost of production, which is the same thing as the cost of labor, be reduced proportionately. By this it is not meant that these manufacturers desire to see the reduction in wages that would come from a reduction in the tariff, but simply that their position as manufacturers would not be very severely interfered with should such a reduction in wages be forced upon them. They of course realize that under such circumstances the purchasing power of the nation and its general prosperity would be reduced, and they are also aware that weak concerns would go to the wall, but in the end they could endure the reduction if labor and the nation at large would be satisfied to have it.

This feeling among manufacturers, and their belief that the burden of defending the tariff has been placed upon them and has not been sufficiently undertaken by the nation at large, and especially by workingmen, is the reason of the little apparent interest that is taken at the present time in propositions that have been presented to Congress for reduction in the tariff. There is a general inclination on the part of manufacturers to let Congress do its worst, and if those who are interested in maintaining the tariff do not rally to its defense—that is, if labor and those who furnish labor with the necessities of life do not come to the rescue—that they, not the manufacturers, will be the sufferers and losers. We have no doubt that the manufacturers of the country will be found expressing their views on any proposition that is brought before Congress, but every year they show less and less solicitude, and seem to be determined that hereafter those in whose interest the tariff is levied shall bear the burden of the struggle for its maintenance.

Immigration in 1884 and 1885.

In its annual volumes, "Commerce and Navigation," the Bureau of Statistics publishes details concerning the occupation and the native land of the immigrants who landed on our shores in the fiscal years 1884 and 1885. The figures thus submitted will afford a fair opportunity to study what elements our emigration is composed of, and whence those who come to seek fortunes in this country hail. Turning first to the question of nationality, and neglecting those countries which have contributed less than 1000 persons, we have the following figures for the two fiscal years 1884 and 1885, ending on the 30th of June:

Country.	1884.	1885.
England.....	53,918	47,202
Ireland.....	61,706	67,706
Scotland.....	9,060	9,226
Wales.....	901	1,127
Austria.....	13,334	11,574
Hungary.....	8,299	8,382
Belgium.....	1,576	1,663
Denmark.....	9,202	6,100
France.....	3,608	3,443
Germany.....	179,676	121,443
Italy.....	16,473	13,599
Netherlands.....	4,198	2,869
Norway.....	16,974	12,366
Sweden.....	11,851	16,038
Poland.....	4,530	8,085

Sweden.....	26,552	22,248
Switzerland.....	9,386	5,805
Quebec and Ontario.....	51,128	30,519
Manitoba.....	1,342	574
Nova Scotia.....	5,849	5,406
New Brunswick.....	1,899	1,132
Cuba.....	1,473	1,674
Azores.....	1,230	1,384
Total.....	518,592	485,316

Grouped geographically and by sexes we have the following:

	1884.	1885.	1884.	1885.
Europe.....	266,970	200,140	185,236	151,318
Asia.....	437	102	73	30
Africa.....	8	46	5	8
America.....	39,854	24,422	29,290	16,737
Islands of the Atlantic.....	882	1,117	491	583
Islands of the Pacific.....	614	468	266	411
All other countries.....	194	37	146	21
Total.....	308,509	236,382	210,083	168,964

Europe, it will be observed, sends yearly by far the greatest contingent of immigrants. The distribution of the sexes was 59.5 per cent. of males in 1884, which declined to 57.2 per cent. in 1885, which is probably due to the circumstance that poor times abroad and here made it possible only to a relatively wealthier class to make the venture of crossing the ocean in search of a new home. Those who are immediately available as producers are even smaller in number. Thus there are among the immigrants in 1884 not less than 123,562 persons under the age of 15, and out of these 64,231 boys and 59,331 girls there were only 146 boys and 122 girls who could lay claim to any occupation. In 1885 the number of persons under 15 years of age included 47,830 boys and 45,050 girls, a total of 92,880, the percentage of the total remaining about the same. Of all the females who immigrated in the years 1884 and 1885 there were only 25,292 in the former and 22,715 in the latter year who had any occupation. To us the most valuable portion of the newcomers are those between the years of 15 and 40, and their status as wage earners is given as follows:

Occupation of Immigrants between 15 and 40 Years of Age.

	1884.	1885.
Professionals.....	1,825	90
Skilled.....	44,709	39,913
Miscellaneous.....	184,949	22,194
Not stated.....	14,082	7,877
No occupation.....	14,987	92,085
Total.....	200,913	125,059

Those more advanced in age, whose habits are set, and who are not likely to accommodate themselves readily to our institutions since they are 40 years of age and upward, are classed as follows:

Occupation of Immigrants 40 Years of Age and Upward.

	1884.	1885.
Professionals.....	857	10
Skilled.....	6,107	234
Miscellaneous.....	25,104	1,729
Not stated.....	1,471	1,183
No occupation.....	1,269	21,967
Total.....	34,955	25,068

The number of immigrants who are classed as following professional occupations is comparatively small. Among them the heaviest contingent are musicians, who, of course, come chiefly from Germany, with 555 in 1884, and 377 in 1885. Then follow teachers, to the number of 445 and 408 respectively, and clergymen, of whom we welcomed 331 and 257. Actors show an increase from 35 to 94, and physicians from 160 to 176. Sculptors, on the other hand, have dropped from 133 to 96. Among those classed under "skilled occupations" carpenters seem discouraged, falling off in numbers from 7216 to 4392 in 1885; 3518 in 1884 and 3413 in 1885 were added to glut the market for clerks. Bakers are represented by 1971 in 1884 and 1465 in 1885, blacksmiths by 2508 and 1819, brewers by 94 and 609 and butchers by 2059 and 1391, in the two years. Of masons 2562 in 1884 and 1893 in 1885 were tempted by our high wages, while 3771 miners in 1884 and 2933 in 1885 came over to delve in our mountains. Of the 2646 and 1000 spinners the majority are women, of whom only very few acknowledge that they are older than 40. Tailors number 5771 and 2933 respectively, and shoemakers 2931 and 2150, while painters muster 1306 and 929 in 1884 and 1885.

The two most interesting classes as a subject of special study are the laborers and the farmers, who are included in the group of miscellaneous occupations. We are indebted to the following countries for the laborers who come to us:

Country.	1884.	1885.
England.....	11,395	10,003
Ireland.....	19,704	18,412
Scotland.....	1,111	1,381
Austria.....	4,581	8,299
Bohemia.....	1,576	1,220
Hungary.....	8,299	4,382
Denmark.....	1,825	1,468
Germany.....	25,761	18,448

of figures giving the nationality of the farmers who come to till our soil, which will be found interesting:

Farmers Immigrated.			
Country.	1884.	1885.	1886.
England.....	1,869	1,401	1,456
Ireland.....	1,527	1,456	1,456
Scotland.....	356	344	344
Denmark.....	1,451	810	810
Germany.....	18,735	11,135	11,135
Italy.....	2,140	1,136	1,136
Norway.....	1,288	724	724
Sweden.....	1,519	1,042	1,042
Switzerland.....	1,464	1,004	1,004
Quebec and Ontario.....	5,820	4,696	4,696
Total.....	42,050	27,585	27,585

A comparison of the two tables shows how largely the number of laborers predominates over the farmers among the immigrants from Great Britain. It proves that for nearly one of the former class one of the latter comes to us from Germany, and that the men who come to us from Canada are chiefly farmers. Another large class are the servants, of which Ireland furnishes nearly one-half, 10,000 out of 24,249 in 1884 and 9,026 out of 20,213 in 1885. England sent 2,750 and 2,470 respectively, Germany 2,944 and 2,132, and Sweden 2,015 and 1,642 respectively. Of these 23,320 out of 24,249 in 1884 and 19,461 out of 20,213 in 1885 were females.

The following indicates in what small numbers immigrants affect the question of skilled labor in our foundries and iron works:

	1884.	1885.
Iron fitters.....	75	52
Iron founders.....	19	23
Iron molders.....	154	139
Iron puddlers.....	29	15
Ironworkers, not elsewhere specified.....	77	57
Machinists.....	232	366
Metal rollers.....	8	5
Metal-workers.....	45	35
Steel manufacturers.....	14	7
Tool grinders.....	11	19
Tool-makers.....	7	5
Wireworkers.....	—	15

In this list there is certainly nothing to cause any fear of competition among our working population. Taken as a whole the percentage of able bodied men between 15 and 40 years of age in the large number of immigrants is not great, since it was only 38.5 per cent. in 1885 and 44.8 per cent. in 1884.

Value of a Guarantee.

The precarious nature of a guarantee, and the danger of creditors trifling with or changing the terms of the main contract if they desire to assert their right to fall back on the collateral promise, are illustrated in several recent decisions of the courts, which should serve as warning and instruction to the business public. These decisions cannot be said to enunciate any new principles, but they are interesting and important if only as positive affirmations of established law. A guarantee—that is, a promise by a disinterested party to pay the debt of another person if he does not or cannot—is generally if not always made for the accommodation or benefit of the person so guaranteed exclusively. The guarantor receives no consideration or value for his promise, but acts merely from friendly feeling without any hope or expectation of personal gain or advantage. He relies on the honor and financial soundness of the one whom he guarantees. It is seldom that a guarantor becomes such expecting that he will ever be called upon to pay the debt. Nevertheless, although the guarantor receives no value or consideration for his promise, it is not a contract without consideration in such a sense as to exempt him from liability to the creditor. He is held to accountability on the ground that, as the creditor advanced the money or gave the credit to the debtor, relying on the guarantee to protect himself, the guarantor cannot in equity be allowed to allege want of consideration and stultify himself by repudiating his promise, especially where this course would result in pecuniary damage. The consideration lies in the fact that the creditor has parted with something of value on the faith of the guarantee, and that he would be injured by its repudiation.

Now, while all this is true, the fact remains that the guarantor is not benefited, and for this reason the principal contract between the debtor and creditor must be strictly carried out to hold the guarantor on his collateral promise or contract. Any subsequent variation from the terms of the main contract, or any dealings between the debtor and creditor prejudicial or likely to be prejudicial to the guarantor, relieves him from liability. The contract and its attendant circumstances are construed strictly and always in favor of the guarantor. He is discharged by a release of his principal—that is, the debtor—as effectually as he would be by payment. The law requires that the contract of guarantee shall be in writing for the further protection of the guarantor. He cannot be held on a verbal promise to pay the debt of another. If the creditor holds any security from the debtor, such as a mortgage or a pledge, and yields it up to the debtor without the guarantor's consent, the latter is freed of liability for the debt. A creditor, moreover, cannot grant any extension of time to the debtor for a consideration, or make any renewal, such as renewed notes, with safety, as such a course discharges the guarantor. This last point is especially important and interesting, as it is the most frequent method by which the value of a guarantee is destroyed. Business men very often grant such delays or renewals without thinking, or, in fact, knowing, that they are thereby losing their right to fall back on the guarantor. This arises generally not from any carelessness or indifference as to the guarantee, but merely

from ignorance of the law, and it is surprising how many cases betraying this state of facts have come into court of late. We may infer from them what a large number of instances there must be where the creditor does not seek to recover his loss and the case does not come before the legal tribunals at all.

One of the late decisions referred to above was rendered in the case of the Delaware, Lackawanna and Western Railroad Co against Benthard adversely to the plaintiff, Benthard being the guarantor. The latter guaranteed the railroad company for all coal sold to Frank Florack, and agreed to pay for the same, whether the indebtedness was in open account or embraced in notes, drafts or bills of exchange. The company shipped coal to Florack, and gave him credit to the amount of \$15,000. Florack gave the company, among other obligations, his note for \$2500 at three months, and at its maturity paid a small part of it, and gave a new note at three months for the balance. Shortly afterward Florack gave the company another note for \$2506, and at its maturity paid part of it, as in the case of his previous note, and gave a new note at one month for the balance, which on its maturity was again renewed. Florack was unable to meet all these notes, and the railroad company sued Benthard on the guarantee. It was held that while there was a continuing guarantee, the acceptance of renewed notes altered the terms of the contract of guarantee, which could not be construed to cover such new arrangements, because a guarantee is to be taken strictly and construed in favor of the guarantor where there is doubt, so as to relieve him from responsibility.

In another case it was shown that S. Wright & Co. were engaged in the manufacture of goods which they consigned to plaintiffs for sale, with liberty to draw for a certain proportion of their value, the draft being sold and the proceeds credited to the drawers. On the 23d of June S. Wright & Co. borrowed of the plaintiffs \$5000, giving as security two notes, one at four and the other at five months, indorsed for their accommodation. In August S. Wright & Co. gave their note, dated June 23d, for the amount of the loan, payable one day from date. After the notes indorsed by defendant became due an agreement was made between plaintiffs and makers without defendant's knowledge or consent that the said makers should draw time drafts on plaintiffs to cover the loan, which plaintiffs agreed to accept and sell and thus be kept in funds to the amount of the loan. In pursuance of this agreement drafts were drawn, accepted and sold. In an action upon the notes it was held that by the new agreement there was a clear intention on the part of both parties to extend the time, that the agreement was for a sufficient consideration and was valid, and that thereby defendant, the guarantor, was discharged. A valid agreement to extend the time of payment operates to suspend the right to prosecute, and so discharges the indorser. It should be remembered, however, that such an agreement, if not based on some new and valuable consideration, does not have such an effect. A mere verbal promise to extend the time of payment is not an enforceable contract, nor, in fact, of any value whatever, and does not affect the guarantor's liability.

Although overshadowed as a topic of discussion in and out of Congress by the silver question, attacks on the tariff crop up now and then. It is asserted in a number of dispatches from Washington that several of the Northwestern railroads have begun an aggressive movement looking to reduction of the duty on steel rails to \$7 or \$8. Judging from the reports to newspapers which have been prominent in their urgency for tariff changes, this alleged movement has been greatly exaggerated.

The Report of the Fortification Board.

The Fortification Appropriation bill passed at the close of the last Congress provided for the appointment by the President of a board, of which the Secretary of War was to be president, to be composed of two officers of the Engineer Corps, two from the Ordnance Corps, two officers of the line of the navy and two civilians. This board was to examine and report at what ports fortifications or other defenses are most urgently required, the character and kind of defense best adapted for each, with reference to armament and the utilization of torpedoes, mines or other defensive appliances. The board was appointed in the latter part of last May, and consisted of William C. Endicott, Secretary of War, president of the board; Brig.-Gen. Stephen V. Benét, Chief of Ordnance; Brig.-Gen. John Newton, Chief of Engineers; Lieut.-Col. Henry L. Abbott, Corps of Engineers; Capt. Charles S. Smith, Ordnance Department; Com. W. T. Sampson, U. S. Navy; Com. Casper F. Goodrich, U. S. Navy; Mr. Joseph Morgan, Jr., of Pennsylvania, and Mr. Erastus Corning, of New York.

A large volume of evidence taken by the board will accompany the report, together with a number of appendices, making altogether the most thorough exposition of the needs of the country's coast defense ever presented to Congress. Some of the evidence the board has eliminated from the document to be sent to Congress, for the reason that it unnecessarily exposed the weakness of our seacoast and would invite attention to ports requiring strong defenses. It is understood

that the board estimates that an appropriation of \$21,000,000 will be necessary the first year to carry into effect its plan of fortifications and providing for their armament. The latter includes the establishment of one or two gun foundries, the recommendations of the Gun Foundry Board being that the plant for the War Department should be at Water-vliet Arsenal, New York, and for the Navy at the Washington Navy-Yard. These recommendations were arrived at by the Foundry Board after a most careful examination of the question where plants could be profitably and satisfactorily established. They are referred to as being the places where great guns could be produced to the best advantage. The aggregate of the amount to perfect the plan, it is said, is \$126,000,000, and a period of six years will be required to complete it. The scope of the report is defined in the law creating it. Portland, Portsmouth, Boston, Newport, New York, Philadelphia, Baltimore, Norfolk, Wilmington, Charleston, Savannah, Pensacola, New Orleans, Mobile, Galveston and San Francisco are places where fortifications or additional defenses are urgently required, though at some of the ports of lesser importance, except where the Government has naval stations, the necessity for their immediate construction is not emphasized. Washington is included in the plan of defense arranged for Baltimore and Norfolk. The mouth of the Columbia River is also one of the points to be protected on the Pacific Coast, to prevent ingress and protect Portland, in Oregon.

In considering the utilization of torpedoes, mines and other defensive appliances, as well as the size and power of the guns and the protection of the forts or defenses, the board has adhered strictly to the line of knowledge which practical tests have shown to be the most reliable, and have avoided special claims of every kind in their report. The necessity for impregnable defenses is assumed. The means by which from these positions the approach of the great armored vessels with their far-reaching guns can be successfully disputed is the other object to be attained. Only existing weapons and projectiles are discussed in the report. The board, though appointed to consider the subject of coast defenses, was obliged to also consider the great progress made in naval warfare and the capacity of some of the modern guns to throw missiles many miles. The erection of land defenses, for instance, about New York would not prevent the shelling of Brooklyn from a distance, which it would be difficult, if not impossible, to prevent by land fortifications. This is also true of Boston, Charleston, Galveston and San Francisco. Under the clause, therefore, "at what ports fortifications or other defenses are most urgently required, the character and kind of defense best adapted for each," the board found it necessary to establish, as the first line of coast defense, floating batteries or armored ships capable of offensive and defensive warfare; gunboats for the ports reached by inland waters and torpedo-boats for general use in deep water and shallow rivers. The 13 floating batteries, estimated to cost \$3,000,000 each, would be distributed as follows: New York harbor, four; Boston, Charlestown, Pensacola and Galveston, one each; San Francisco, two; entrance to Delaware River, one, and for the protection of Baltimore, Washington and Norfolk, two, to be stationed at Hampton Roads, or near the mouth of Chesapeake Bay. Besides these the necessities of a cruising navy as auxiliary to the first line of defense are also fully considered. The torpedo-boats required for the land defenses of the front of the fortifications will be of heavy armor plates and of such thickness as to be impervious to any distance even at close range. The kind of turrets for the protection of the heavy ordnance to be mounted on shore will be hereafter determined, according to tests to be made to secure invulnerable defenses for the coast guns. The approaches will be so arranged as to deflect shots aimed at them.

The probability of dynamite being utilized as a means of destruction in the event of an attack on our seacoast defenses is not, it is said, recognized by the board. Nor is it regarded as a means of protection against a sea attack, except in connection with torpedoes. In this connection Mr. Michael Jacobs, of New York, who is perfecting the Hayes nitro-glycerine shell, says that if dynamite can be safely and effectually used in a shell thrown in the ordinary way, while it may not change the character of armored ships, it will certainly change the plans of every seacoast defense. The first fact which is to be established by the Ordnance Bureau of the Navy Department is whether such a shell can be as safely fired as an ordinary shell. When this is accomplished the next fact to be ascertained is whether such an explosion will be as destructive to ships and fortifications as is now believed. Commodore Walker, Chief of the Bureau of Navigation at the Navy Department, says that the theory of ordnance experts is that the instantaneous bursting of a dynamite shell which follows concussion would not be as effective as one having the power of penetration and exploded in the present way. That, however, is now only a theory, which Mr. Jacobs says will be satisfactorily tested when he is ready to furnish the Navy Ordnance Bureau with the shells. They are in every respect as a projectile identical with the form of shell as now used. The explosive material does not become nitro glycerine until the shell is discharged from the gun.

That is all that is claimed, and that the ordnance experts are going to verify as soon as possible. If the three elements of dynamite can be kept apart and only released and commingled by the velocity of the shell, as it is said is provided in the Hayes nitro-glycerine shell, naval officers admit that safety in handling and firing is established. If as a weapon of destruction it should be found as effective as dynamite is supposed to be, it will not only be an important adjunct in modern warfare, but will also challenge the genius of naval constructors to devise a ship that can resist its fearful power. Accompanying the report is also a statement of all the vessels in the world carrying great

guns, their capacity for offensive and defensive warfare, the number of officers and men required to man them, the distance which each can throw shot and shell, and their ability to resist attack from another vessel.

The defenses for the lake ports include Buffalo, Cleveland, Sandusky, Toledo, Detroit, Chicago, Milwaukee, Duluth and some other ports along the line of the lakes. Under the provisions of the treaty with Great Britain, concluded April 28, 1817, the naval force to be maintained upon the American lakes by the United States Government is limited by a certain number of small vessels. At present a compromise exists by which the United States steamer Michigan, having a tonnage equal to the small vessels allowed, is permitted to patrol the lakes. The board, therefore, was restricted by the treaty in planning a water line of defense, but it is understood the plan agreed upon will be found effective without requiring an abrogation of the treaty provisions. The construction of the land line will be immediately under the control of the army. It is possible that a fleet of torpedo-boats may be constructed, such as could be readily transferred from the sea coast to the lakes via the Erie Canal in case they should be required for immediate service on the lakes. The lake outlet of the canal, therefore, is one of the points especially to be strongly fortified.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., January 25, 1886.

SUB-COMMITTEE OF WAYS AND MEANS.

The chairman of the Committee on Ways and Means has announced the following sub-committees to have charge of different subjects entering into the bills referred for consideration and report:

On Public Debt, Funding and Payment Thereof—W. R. Morrison, of Illinois; W. C. P. Breckinridge, of Kentucky; W. D. Kelley, of Pennsylvania.

On Revenue Provisions of Commercial Treaties—R. Q. Mills, of Texas; W. C. Maybury, of Michigan; Frank Hiseock, of New York.

On Amendments of Customs Laws—Abram S. Hewitt, of New York; C. R. Breckinridge, of Arkansas; W. McKenley, Jr., of Ohio.

On Relief Bills and Claims—Benton McMillen, of Tennessee; W. C. Maybury, of Michigan; T. R. Reed, of Maine.

On Amendments of Internal Revenue Laws—H. R. Harris, of Georgia; W. C. P. Breckinridge, of Kentucky; T. M. Browne, of Indiana.

On Importation of Fish, &c.—C. R. Breckinridge, of Arkansas; W. C. Maybury, of Michigan; T. R. Reed, of Maine.

TARIFF PROSPECTS.

There is no doubt whatever of the introduction of a tariff reduction bill by the Committee on Ways and Means. Mr. Morrison has informed the correspondent of *The Iron Age* that he is again at work on such a measure, and has commenced his renewed efforts by conferring with the gentlemen who have submitted bills which have been referred to the committee. The measure upon which Mr. Morrison has been at work since last summer, with the aid of certain authorities on pro-British economic policy, will not be materially changed in theory, though in a few details it will be adapted to the views of certain elements of the majority in order to promote harmony when the bill comes into the House for discussion and action. Mr. Morrison indicates that he is willing to recede a little from the amount of reduction claimed in former measures, so as to establish the principle of gradual reduction in the rates of duty, and in a subsequent measure in the next Congress to go a step further. The effect of these incessant agitations on the industries of the country does not appear to enter into the calculations of Mr. Morrison and his friends. The view expressed by Mr. Morrison is to report to the House what might be regarded as a moderate measure, with a view to the invitation of a general discussion of the tariff question upon which the friends of tariff reduction can enter into the Congressional campaign a few months hence. The results of that campaign will then decide the question as to how much further the pro-British economic theory shall govern in future legislation on the tariff.

SENATOR MORRILL'S VIEWS.

Senator Morrill, chairman of the Committee on Finance, says: "Speaking for myself, I do not think that it would be expected just now to pass the resolution against a reopening of the tariff question. As a member of the Finance Committee, I think it would be better to await the action of the House, and by that means ascertain precisely what position they will take. I do not think it good tactics to announce in advance what the Senate will do. I have no idea that the House will send us a bill which the Senate will be likely to pass, but it may be just as well to accept an opportunity to take action upon a measure, so as to get the issue squarely before the people. There is a great deal of deception practiced under the guise of protecting American labor, and that might as well be understood and ventilated now as later. If, as the President says in his message, the protection of American labor is the most justifiable pretext for a policy of protection, then it might be well to show whether a protective tariff or a revenue tariff meets that requirement. I am opposed to agitation, but under the circumstances it may be as well to have the question placed before the people."

THE ADMINISTRATION TRYING TO PROMOTE HARMONY.

There have been several conferences between the supporters of Mr. Randall's views and Mr. Morrison, which indicates that some agreement will be reached on the amount of reduction to be assigned to each of the schedules. This action, it is understood, has been taken at the suggestion of the Administration, and is the secret of the disposition of both Mr. Morrison and Mr. Randall to recede from the extreme positions which

they held in the last controversy on the same subject. There is also some apprehension that such a moderate measure may be presented as will exert an influence over some of the less enthusiastic protection Republicans.

THE SILVER QUESTION TO ENTER INTO THE CONTENT.

The silver managers are also trying to turn their interests to account by negotiating an alliance offensive and defensive with either side of the tariff controversy which will support their views in favor of silver. Mr. Morrison is now in frequent conference with the department and others formulating a tariff bill which will meet all the views of his party and that will be put forth substantially as an Administration measure.

LATEST CUSTOMS DECISIONS.

Steel rods, 3 feet in length, larger than No. 5 wire gauge, were decided by the court, in the case of Frasse vs. Robertson, to be dutiable, inasmuch as they cost over 10 cents per pound, at the rate of 3½ cents per pound, under the provision in Schedule C, T. I., new, 177, for steel in bars. This decision of the court, which, by the advice of the United States Attorney-General, has been acquiesced in by the department, reverses the ruling of January 26 (Synopsis 6142). The latter decision is therefore revoked.

The additional duty prescribed by Section 2900 of the Revised Statutes is not a penalty within the purview of any of the penal sections of the statute, and the Secretary of the Treasury has no authority to relieve importers from the payment of such additional duties when they legally accrue and have been assessed by the collector of customs.

No refund of duties can be made on imported merchandise which, on importation, was entered for consumption, and after due delivery to the importers was destroyed by fire, the merchandise not being at the time of the fire within the custody or control of the Government.

The Outlook for Tin.

So far the expectations entertained in December have not been fulfilled, and business in merchandise generally, and in tin in particular, has opened decidedly flat, for what precise reasons it is difficult to determine. It is evident that politically the situation in Europe is anything but reassuring. England, usually so calm internally, is deeply agitated, and opinion on leading topics hopelessly divided; and on the Continent the leading powers, apparently still in a conciliatory mood, are secretly preparing for an emergency which may arise at any moment from the threatening relations between Turkey and her smaller neighbors. On this side there are, from all appearances, sound elements for a further revival in trade and industry, but the incubus of the silver question and the possible monetary and financial disturbance that may arise from a wrong solution of it in Congress cause uneasiness in financial and commercial circles. The hesitation, therefore, on the part of business men on both sides of the Atlantic at a moment when in other respects the dawn of a more prosperous period seemed at hand is thus in a measure accounted for.

Tin having been one of the few leading articles which in Europe and America increased in value last year, is now looked upon with all the greater suspicion, since it opened the year with the full advance that had been reached in 1885, when the course of Straits in London was as under:

	Price.	Visible supply.
	£ s. d.	tons.
January 1.....	74 10 0	13,183
February 1.....	76 5 0	13,685
March 1.....	79 0 0	13,811
April 1.....	78 10 0	13,861
May 1.....	80 0 0	13,926
June 1.....	91 0 0	13,512
July 1.....	94 0 0	13,618
August 1.....	94 0 0	13,676
September 1.....	91 5 0	13,846
October 1.....	91 10 0	13,936
November 1.....	91 10 0	13,173
December 1.....	93 10 0	13,212

The following figures show the supply and demand of foreign tin for Europe and America:

	1885.	1884.	1883.
Total visible supply, Europe and America, December 31.....	13,776	13,193	15,825
New supply, December.....	3,075	2,575	2,915
Consumption, December.....	2,902	2,421	2,874
Supply 12 months, ending December 31.....	33,915	33,770	36,013
Consumption 12 months, ending December 31.....	33,598	36,487	35,505

Consumption, it will be seen, fell off 2859 tons on the alleged decrease of tin used for tin-plate manufacture in Wales, although the exports of the latter for the whole year were, as per the Board of Trade returns: 1885 (December estimated), 301,523; 1884, 288,708; 1883, 269,375. As the restricted production of tin plates was maintained during the entire latter part of 1885, while consumption of tin only declined about 2000 tons the last quarter, we have a suspicion that the high price was caused as much by the diminished consumption as by the fact that less tin plates were made. While the combined statistical position is thus shown to have been the reverse of favorable at the opening of the new year, the weakness observable here in all the present month has been something remarkable. There has been great pressure in this market to sell for London account, large quantities being daily offered, most probably for the purpose of easing the market there, stocks being on the increase on the other side; but as our visible supply is at present about 4000 tons, and will suffice for our wants up to at least the middle of April without drawing upon London, these offers have found no takers, although the price asked for them was ¼ cent below the London equivalent, adding charges.

Whether in the face of these facts, and the general disinclination now prevalent in Europe and America to operate for a rise in any article till the future is better defined, there is much likelihood that a bolstered-up metal like tin can be upheld at the present high ruling much longer is very doubtful, although we readily admit that the resumption of tin-plate production in full since January 1 may to a degree operate in its favor.

ROOT'S HANDY CLOTH BOUND HARDWARE PRICE CARDS, FOR EITHER WHOLESALE OR RETAIL TRADE.

COPYRIGHTED 1885.

(CARD
No. 11-A.)

THESE CARDS COVER the lines having a large variety of sizes or numbers, avoid marking each package or article, in Retail Stores, and are very convenient for use in Wholesale Sample Rooms. They secure correct and uniform selling prices, pay for themselves several times a year by saving time, and are intended for at least ten years' constant use. Hence, no Hardware Dealer can afford to do without them, or spend the time required to write and rule out something similar by hand. They are printed in very distinct type, on the best *Byron Weston's Ledger Paper*, appropriately ruled with blue ink cross-lines and red ink down rulings,

DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
1	5½ x 18 in. 40c.
2	3 x 13½ in. 30c.
3	3 x 13½ in. 30c.
4	6 x 16 in. 40c.
5	3 x 13½ in. 30c.
6	3 x 13½ in. 30c.
7	3 x 13½ in. 30c.
8	3 x 13½ in. 30c.
9	3 x 13½ in. 30c.
10	3 x 13½ in. 30c.
11	3 x 13½ in. 30c.
12	3 x 13½ in. 30c.
13	3 x 13½ in. 30c.
14	3 x 13½ in. 30c.
15	7 x 15 in. 50c.
16	3 x 13½ in. 30c.

SAWS.

DISSTON'S NO. 3.		PANEL, HAND & RIP.		W. M. & C. NO. 12.	
Length In.	List.	Cost.	Job.	Sell.	
16					
18					
20					
22					
26					
28					

DISSTON'S NO. 7.		PANEL, HAND & RIP.		W. M. & C. NO. 25.	
Length In.	List.	Cost.	Job.	Sell.	
16					
18					
20					
22					
26					
28					
30					

DISSTON'S NO. 8.		HAND AND RIP.		W. M. & C. NO. 26.	
Length In.	List.	Cost.	Job.	Sell.	
26					
28					

DISSTON'S NO. 8.		HAND AND RIP.		W. M. & C. NO. 27.	
Length In.	List.	Cost.	Job.	Sell.	
26					
28					
30					

DISSTON'S NO. 12.		HAND AND RIP.			
Length In.	List.	Cost.	Job.	Sell.	
26					
28					

OUR BRAND.					
PANEL, HAND AND RIP.					
Length In.	List.	Cost.	Job.	Sell.	
16					
18					
20					
22					
26					
28					

SPECIAL C. S. PANEL AND HAND.					
Length In.	List.	Cost.	Job.	Sell.	
16					
18					
20					
26					

COMBINATION HAND.					
Length In.	List.	Cost.	Job.	Sell.	
26					

DISSTON'S NO. 1.		BACK.		W. M. & C. NO. 5.	
Length In.	List.	Cost.	Job.	Sell.	
10					
12					
14					
16					

for noting in pencil—List, Cost, Jobbing and Selling Prices—as in sample of Card 11-A, shown in the center of this page. Cards A and B of each number are mounted on each side of a tough, heavy card-board, especially adapted for this use, which is further protected on the four edges by being *cloth bound*. Two-thirds of them are 3 x 13½ inches. This size has been found convenient for hanging on a pilaster finish, or any other narrow surface, without hiding the goods. To hang or chain up each card there is firmly inserted through the top and center a nickel-plated eyelet about ½ inch inside diameter. They will be sent, *charges prepaid*, on receipt of price.

DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
17	6 x 18½ in. 40c.
18	3 x 13½ in. 30c.
19	3 x 13½ in. 30c.
20	3 x 13½ in. 30c.
21	3 x 13½ in. 30c.
22	3 x 13½ in. 30c.
23	3 x 13½ in. 30c.
24	3 x 13½ in. 30c.
25	7 x 22 in. 70c.
26	7 x 22 in. 70c.
27	7 x 22 in. 70c.
28	7 x 22 in. 70c.
29	6½ x 22½ in. 70c.
30	7 x 24 in. 70c.
31	6 x 22 in. 70c.
32	4 x 14 in. 20c.

LESS THAN A SET PRICED AT THE ABOVE RATES.

PRICES IN SETS.

Set No. 1. Includes all the numbers, 1 to 32 inclusive Price, \$10.00 per set.
Set No. 2. Omits Cards Nos. 25, 26, 27, and includes all the other numbers described above..... " 8.00 "

Set No. 3. For Dealers in Tinware and House Furnishing Goods, consists of Cards Nos. 25, 26, 27..... Price, \$2.00 per set.
Set No. 4. Includes the following Eighteen Leading Cards for Retail Trade: Nos. 2, 3, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 22, 23, 24, 25, 31, 32..... " 5.00 "

SENT PREPAID ON RECEIPT OF PRICE BY

DAVID WILLIAMS, Publisher and Bookseller, 66 & 68 Duane Street, N. Y.

THE Iron Age Directory AND Index to Advertisements.

Advertising Agents.

Rowell Geo. P. & Co., 10 Spruce, N. Y. 14

Agricultural Implements.

Nash & Bro., Millington, N. J. 41

Air Brakes.

Westinghouse Air Brake Co., Pittsburgh, Pa. 4

Air Compressors.

Clayton Jas., Brooklyn, N. Y., and New York City, 48

Alarm Money Drawers.

Tucker & Dorsey Mfg. Co., Indianapolis, 36

Anti-Friction Metals.

Reeves Paul S., Philadelphia, 48

Arms, Manufacturers of.

Eagle Anvil Works, Trenton, N. J. 9

Arms and Ammunition.

J. P. Lovell's Sons, Boston, Mass. 6

Asbestos.

Chalmers-Spence Co., 419 8th, N. Y. 9

Ash Sifters.

Blanchard's Sons, Porter, Concord, N. H. 14

Augers and Bits.

Jennings C. E. & Co., 90 Chambers, N. Y. 30

Axles, Springs, &c.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. 36

Axle Springs.

Light Spring & Axle Co., Pittsburgh, 8

Axles.

Wurster F. W., Brooklyn, N. Y. 48

Axes.

Wm. W. Jr. & Co., Lewistown, Pa. 14

Axe Heads.

Peck A. G. & Co., Cohoes, N. Y. 48

Axe Wedges.

Brooks H. & Co., Boston, Mass. 44

Bankers.

Gaulleaud P. W. & Co., 2 Wall, N. Y. 13

Bar Iron.

Virginia Nail and Iron Works Co., Lynchburg, Va. 14

Barb Wire & Fence.

Gautier Steel Dept. of Cambria Iron Co., Johnstown, Pa. 36

Barbed Wire.

Hawley Steel Barbed Wire Co., Burlington, N. Y. 3

Barbed Wire.

Iowa Barb Wire Co., Worcester, 3

Barbed Wire.

Washburn & Moen Mfg. Co., Worcester, 3

Bellevue, Manufacturers of.

Bullock T. H., Cleveland, O. 14

Bells (Sleigh).

Scott Geo. M., Chicago, Ill. 42

Belted.

Bevin Bros. Mfg. Co., Easthampton, 10

Belted.

Alexander Bros., 412 N. 3d, Philadelphia, 30

Belted.

Coiled Wire Belting Co., 93 Cliff, N. Y. 44

Belted.

Main Belting Co., Lockport, N. Y. 38

Belted.

N. Y. Belting & Packing Co., 13 & 15 Park Row, N. Y. 13

Bicycles.

Pope Mfg. Co., 397 Washington, Boston, 48

Bird Cages.

Lindeman O. & Co., 254 Pearl, N. Y. 3

Bird Cages.

Maxwell John, 247 and 249 Pearl, N. Y. 3

Bird Cages.

Osborn Mfg. Co., 79 Wheeler, N. Y. 15

Bird Cages.

Pierce Geo. N. & Co., Buffalo, N. Y. 15

Bird Cages.

Brown R. H. & Co., New Haven, Conn. 46

Blasting Supplies.

Atina Powder Co., Chicago, Ill. 58

Blind Sewing Machines.

North F. O. & Co., Boston, Mass. 12

Blocks, Tackle, Makers of.

Hagall & Laid, Boston, Mass. 11

Blocks, Tackle, Makers of.

McCallum Wm. H., 113 South, N. Y. 11

Blocks, Tackle, Makers of.

Moore Mfg. Co., Chicago, Ill. 11

Blocks, Tackle, Makers of.

Penfield Bros. Co., Lockport, N. Y. 14

Blocks, Tackle, Makers of.

Shubert & Cottingham, Philadelphia, Pa. 11

Boiler Plates.

Wm. McVain & Sons, Reading, Pa. 45

Boiler Plates.

The Seidel & Hastings Co., Wilmington, Del. 26

Boiler Plates.

Boilers, Steam.

Boiler Co., 22 Cortlandt, N. Y. 9

Boiler Plates.

Dickson Mfg. Co., Scranton and Wilkes-Barre, Pa. 47

Boiler Plates.

Boilers, Steam, Makers of.

Cooke & Co., 22 Cortlandt, N. Y. 9

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Special Notices.

RECENT BOOKS.

Bell.—Principles of the Manufacture of Iron and Steel, with Some Notes on the Economic Condition of Their Production. By I. Lowthian Bell, F.R.S.; 10 full-page plates, 744 pages, 8vo, cloth, \$6.

This extended and comprehensive treatise is an outgrowth, as stated by the author in his introductory chapter, of a request, from the British Iron Trade Association, to prepare a report on the present condition of the manufacture of iron and steel as illustrated by the objects displayed at the French International Exhibition of 1878, in Paris. This work contains not only the general results then arrived at, but also more extended investigations and experiments which it was considered necessary to pursue to thoroughly discuss the subjects under treatment. The appended headings of the 18 sections into which the volume is divided will give an idea of its scope:

Section I. Introductory. Section II. Historical. Section III. Direct Processes Preliminary Treatment of Materials for the Making Malleable Iron. Section IV. for Blast Furnace. Section V. The Blast Furnace. Section VI. On the Use and Theory of the Hot Blast. Section VII. On the Quantity and Quality of the Fuel Required in the Blast Furnace Using Air of Different Temperatures. Section VIII. On the Solid Products of the Blast Furnace. Section IX. Chemical Changes as They Take Place in the Blast Furnace. Section X. On the Equivalents of Heat Evolved by the Fuel in the Blast Furnace. Section XI. On Hydrogen and Certain Hydrogen Compounds in the Blast Furnace. Section XII. On the Production of Malleable Iron from Pig Iron in Low Hearths. Section XIII. On the Refining and Puddling Furnace. Section XIV. On More Recent Methods of Separating the Substances Taken Up by Iron During Its Passage Through the Blast Furnaces. Section XV. Statistical. Section XVI. British Labor Compared with That of the Continent of Europe. Section XVII. On Labor in the United States of America. Section XVIII. Chief Iron-Producing Countries Compared.

Plumbing and House Drainage Problems from The Sanitary Engineer; 146 illustrations, 244 pages, 8vo, cloth, \$2.

Many of the most difficult problems arising in a plumber's practice are practically solved in the questions, answers and descriptions collected in this volume. Under several general heads are considered the subjects of dangerous blunders in plumbing; city and country house drainage; water supply and hot-water circulation in buildings. The plumbing laws and regulations of New York, Brooklyn and Boston are included in the book, and also a form of plumbing specification for a country house.

Bancroft, R. M. and F. J.—Tall Chimney Construction; a Practical Treatise on the Construction of Tall Chimney Shafts, containing Details of upward of 80 existing Mill, Engine-House, Brick Works, Cement Works and other Chimneys in England, America and the Continent, constructed in Brick, Stone, Iron and Concrete. \$5.50.

Boulton, C. B.—The Preservation of Timber by the Use of Antiseptics. 50 cents.

Cutler, H. A. and Edge, F. J.—Tables for setting Out Curves from 100 feet to 500 feet radius, use for setting out roads, sewers, walls, fences and general engineering work. \$1.

Sent, postpaid, on receipt of the price by
DAVID WILLIAMS,
Publisher and Bookseller,
66 and 68 Duane St., New York.

WANTED.—A Hardware Man, 18 years' experience, wants position as Buyer, Salesman or Manager. Co. up to retail, wholesale or retail. Would go West or South. Best of references. Address, **BIGGS,** care of *The Iron Age*, 66 and 68 Duane Street, New York.

WANTED.—A situation as Rolling Mill Superintendent or Assistant, having 20 years' experience, built and superintended 20 mills for rolling Plate, Rails and Bars; can furnish first-class references. Address, "J. H. B.," Office of *The Iron Age*, 66 and 68 Duane Street, N. Y.

Wanted.

A Shear to cut 3 feet wide x 1½ thick and thinner; Guillotine style preferred. Address at once, P. O. Box 952, Pittsburgh.

SCRAP IRON.

We buy and sell all descriptions of Iron and Steel Scrap. Correspondence solicited.

HOFFMAN, PARRY & CO.,
238 S. Fourth St., Philadelphia.

RECEIVER'S SALE.—Offers for the purchase of the real and personal estate of the **JOHN D. LOCKE COMPANY, Limited,** will be received for thirty days from and after this date by the undersigned at either of the below named addresses. This property embraces extensive manufacturing buildings and machinery therein, at Whitestone, L. and a large stock of manufactured tin and metal ware at 44 Cliff St., New York, and at Whitestone aforesaid, together with the good-will of a long-established mercantile and manufacturing business. **JAMES W. COVERT, Receiver.** New York, Jan. 1886. 5 Day St., New York. Porter & Silvert, Receiver's Attorneys, Tribune Building, New York.

FOR SALE.—A well-equipped Manufacturing and Jobbing Machine shop in Montreal. Has established trade capable of extension; or will sell half interest to practical man of managing ability. For particulars, apply to **P. ROBERTSON,** 143 Front Street, New York.

A thoroughly practical Foundry Foreman desires to correspond with parties requiring his services; has had 20 years' experience as such, and is well up in all classes of work. Good references. Address, "S. F.," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Special Notices.

Auction Notice.

HAYDOCK & BISSELL,

WHOLESALE AUCTIONEERS,
LARGE AND PEREMPTORY TRADE SALE OF
HEAVY AND SHELF HARDWARE,
HOUSE-FURNISHING GOODS, &c.,
ON

Thursday and Friday, Feb. 4th and 5th, 1886, at 10 o'clock a. m., at our Salesrooms,
83 Chambers and 65 Reade Sts., New York.

This Sale will comprise large invoices direct from the manufacturers, consisting in part of 1500 Dozen Cast Steel NAIL HAMMERS, CLAW, SHINGLING, HUNTERS, BROAD and LATH HAMMERS, and AXES; 150 Dozen HAND and PANEL SAWS; 1000 Dozen MILL, FLAT, BASS, TAPER and TAPER SAW FILES; 2000 Adjustable Iron PLANES, Single and Double Irons; 75 Cases horse, Shoe, Scrub, Paint, Dust and Stove BRUSHES; 150 Dozen Planers' HOES; 100 Cases adze, Sledge Hammer, Hatchet, Pick and Axe HANDLES; 175 Bench VISES, steel Face; — cases of Hindostani and Washita STONE; — cases of Carpet TACKS; — Bbls. Well WHEELS; 1000 Pieces Tinned and Porcelain-lined SAUCEPANS, BOILERS, &c., all first quality; 2500 Pair Rink and Nickel-plated roller SKATES; also TROWELS, RIVETS, SHELF BRACKETS, WARDROBE HOOKS, STAPLES, PLUMBS and LEVELS, TRY SQUARES, Adjustable BRACES, RUBBER, STATE WIKES, Steel RAKES, D. H. SHOVELS and SPADES, Garden HOES, &c., &c.

This Sale will be worthy the attention of the Trade.

Thursday and Friday, February 18th and 19th,
LARGE SPECIAL SALE OF

TABLE AND POCKET CUTLERY, Seconds,
Comprising over 25,000 Dozen TABLE KNIVES and FORKS, CARVING and BUTCHER KNIVES, Seconds. Also a large line of POCKET CUTLERY, SHEARS, Plated SPOONS and FORKS, &c., &c.
Particulars in future advertisements.

Machine Tools.

EAST NEWARK, N. J., Dec. 31st, 1885.

The partnership doing business under the name of Geo. A. Ohi & Co., composed of Geo. A. Ohi, John P. Hauschild and Henry Binsse, was dissolved on the 15th of October, by limitation. The undersigned will liquidate for the above-named firm, and will transact business at the old stand as manufacturers of Machine Tools, under the style of

THE NEWARK MACHINE TOOL WORKS,
for which they beg your esteemed patronage.

Very respectfully yours,
**HENRY BINNIE,
JOHN P. HAUSCHILD.**

FOR SALE.

VERTICAL CONDENSING ENGINE,

54 in. diam. of cylinder x 48 in. stroke

VARIABLE CUT-OFF.

50-Ton Band Wheel,

20-ft. diam. x 60-in. face.

At a great sacrifice.

MARVIN BRIGGS,

New and Second-Hand Machinery,
69 Rutgers St., cor. Water, New York.

For Sale.

A second-hand 16-inch two-high Roll Train, with full set of Rolls for Merchant Bar, Angles and Splice Bars, with Engine 26 in. x 60 in., all in first-class condition.
Address **BOYLE & BISSELL,** Bissell Block, Pittsburgh, Pa.

FOR SALE.

ROLLING MILL MACHINERY for working old rails. Nearly, if not quite, complete plant. Size of trains, 9 in. and 16 in.

Address **DAN'L W. RICHARDS & CO.,**

92 Mangin St., New York.

For Sale.

One of the best located Hardware stands in Northern Ohio; splendid country trade; best of shipping facilities; will invoice \$15,000 to \$16,000; stand 20 years old; gross sales 1885, \$42,000; in a town of 4000 inhabitants; must sell; reason, ill-health and age of the proprietors.
Address "TRADE MARK," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

Valuable Patents For Sale.

Patents for improvements in Ice Skate, Nos. 197,007 and 197,008, having considerable time to run, and considered by experts to be among the best. For particulars, address,

"A. H. K.," Box 47.

Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

FOR SALE.—A Steam Hammer, built by Benet & Son, 1500 lbs. head; also a pair of Blowing Engines, 4 foot Air and 12-inch Steam Cylinders by 20-inch stroke, 15 inch outlet.
J. LEONARD, 450 West St.

Wanted.

To buy Stocks of goods, parts of Stocks, Job Lots, &c., cheap for cash, of Hardware, Tinware, Woodenware, &c., &c.,
Address "CASH BUYER," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

TO THE PUBLIC.

As a result of 35 invitations issued to Architects, Hardware Houses and Builders to be present on Jan. 22, I witness a test of the Chains now in the market for suspending window shades, we the undersigned tested the different makes of Chains and found the Chains manufactured by Thomas Morton to be the strongest of all tested; A. G. Rogers & Bro., Builders, 112 Bank St., New York; Jackson & Copenhoven, Hardware, 66 Fulton St., Brooklyn; J. W. Ryan & Richardson, Hardware, 50 Hudson St., New York. Full particulars can be had at this office of the above tests. **THOMAS MORTON,** 55 Elizabeth St., N. Y.

Special Notices.

MACHINERY.

1 Corliss Beam Condensing Engine, 30 in. x 72 in.
1 Porter-Allen Engine, 16 in. x 30 in.
1 New Horizontal Corliss Engine, 14 in. x 30 in.
1 New Horizontal Corliss Engine, 12 in. x 30 in.
1 New Horizontal Corliss Engine, 10 in. x 30 in.
1 Horizontal Automatic Cut-off Engine, 12 in. x 18 in.
1 15-Horse Portable Engine and Boiler.
1 10-Horse Copeland & Bacon Hoisting Engine and Boiler.
1 10-H. P. Hoisting Engine and Boiler.
6 Horizontal Tubular Boilers, 5 ft. x 22 ft.
1 New Horizontal Tubular Boiler, 4½ ft. x 14 ft.
1 Horizontal Tubular, 3½ ft. x 14 ft.
1 150-Horse Locomotive Boiler. Steamboat style.
1 Locomotive Boiler, 3 ft. x 12 ft.
1 Upright Boiler, 4 ft. x 12½ ft.
1 Lathes, 22 in. x 12 ft.
1 Lathes, 16 in. x 6 ft.
1 Lathes, 15 in. x 6 ft.
1 Lathes, 15 in. x 4 ft. 6 in.
1 12 in. Slotting Machine.
1 20-in. Upright Drill.
1 36-in. Band Saw.
1 Wood & Light Milling Machine, No. 4.
1 Daniels Wood Planing Machine, 3 ft. x 30 ft.
1 No. 2½ Bliss & Williams Foot Press and Dies.
1 No. 7 Knowles Steam Pump.
1 No. 4 Davidson Steam Pump.
1 2-in. J. Ison Governors.
Shafting, Pulleys, Hangers and Miscellaneous Machinery.
J. GRAY,
No. 37 Dey St., New York.

PRICE BOOKS.

LARGE SIZE, 500 Pages, 6 x 9½ in. Full Leather,

EACH \$8.00.

POCKET SIZE, 250 Pages, 4 x 7 in. Full Leather,

EACH \$1.00.

REVISED AND IMPROVED.

Alphabetical Arrangement.

Indexed Through.

Bills can be priced and quotations noted in one-quarter of time required by old classification. Send for Circulars.

B. LAMBERSON,

Portland, Oregon.

For Sale.

\$1500. The Good-Will and Fixtures of a Brass Foundry, Babcock Metal and Solder Works; established 7 years and run every day; will be sold part cash and on easy terms, and with or without the stock of Metals; terms to suit reliable parties, and will instruct the buyer in all details and receipts belonging to business; we will sell the whole business or retain a part interest.

Address **BRASS FOUNDRY COMPANY,** Office of *The Iron Age*, 66 and 68 Duane St., N. Y. City, for two weeks.

Traveling Salesmen Wanted.

Experienced Salesmen having large acquaintance with the Wholesale and Retail Hardware trade, to sell a line of well-known special goods Can be taken alone or with one or more lines not conflicting. Liberal commission. Address "FACTORY," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

PATENT LIBRARY, COMPLETE,

FOR SALE.

R. D. TUTTLE, — Burlington, Iowa.

WANTED.—Situation by Traveling Salesman of many years' experience in the Iron and Steel trade in all its branches; is well acquainted with the trade and their wants in Pennsylvania and the entire West and South. Address "X. Y. Z.," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED.—Gentleman (36 with over 15 years' experience in the Wholesale and Retail Hardware trade wishes a position with some Manufacturer or Jobbing House; competent to manage Agency or Branch House; and a general business man. Good references and security bonds if desired. Address A. D. C. Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

BUSINESS MANAGER.—The advertiser, aged 35, now occupying position of trust with a large manufacturing concern, desires a change of location on account of health of his family. He is a first-class Bookkeeper and a general business man. Good references and security bonds if desired. Address A. D. C. Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED.—By a man with 10 years' experience, a position as Guide Roller. References if required. Address "ROLLER," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

A RARE BARGAIN.

A nice Retail Hardware business in Lima, Ohio. Splendid location; stock on hand light, fresh and desirable goods in prime order; there are but two other houses in the same line. A splendid chance to invest money, as Lima is growing rapidly and bids fair to become an Oil Center, as there are at present paying Wells in operation and dozens more being put down. Four Railroads enter the city, and it has Car Works, Rail Road Shops and Machine Shops of all kinds. The stock will run about \$5000, and will be sold at a positive bargain. Write at once, as goods must be sold before February 20.
WOLF HARDWARE CO., Lima, Ohio.

WANTED.—Parties who are prepared to manufacture (either under contract or on royalty) Pruning or House Shears. Address for three days "O. M. H.," References exchanged.

WANTED.

A first-class practical man to take charge of Wire and Iron shop as Foreman. Must be reliable, capable and skillful in overseeing the manufacture of general Wire and Iron work. Address, stating experience, references and salary. "IRON WORK," Box 343, Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

WANTED.—By a young man of 10 years' experience in Hardware, to make an engagement with a New York, Philadelphia or Chicago House to travel South. References furnished. Address **THOS. L. GOFF,** 514 N. 8th St., Richmond, Va.

Special Notices.

SECOND-HAND MACHINERY

In Good Order. For Sale Cheap.

1 Engine Lathe, 48 in. x 20 ft. bed.
1 36 in. x 18 ft. "
1 30 in. x 16 ft. "
1 26 in. x 20 ft. "
1 24 in. x 12 ft. " Fifield.
1 20 in. x 8 and 10 ft. bed. Putnam.
1 17 in. x 8 ft. bed.
1 15 in. x 6 ft. Porter. Rod feed only.
1 14 in. x 6 ft.
1 12 in. x 5 ft.
1 Planer, 50 in. x 50 in. x 17 ft.
1 26 in. x 36 in. x 7 ft.
1 30 in. x 30 in. x 8 ft.
1 24 in. x 24 in. x 5 and 6 ft.
1 Shaper each 20 in. and 24 in. stroke.
1 26-in. B. G. Drill.
1 Lincoln Pat. No. 2 Miller.
1 Index Miller. Pond.
1 each 3, 4 Spindle, No. 6 Drills. P. & W. Co.
1 each Nos. 6, 1 and 3 Screw Machines. Machine.
1 Wire Feed, Pratt & Whitney.
1 No. 3 Screw Machine. Plain.
1 450-lb. Drop Hammer. Pratt & Whitney.
1 40-lb. Trip Hammer.
1 "Little Joker," Plating Machine.
1 No. 3 Stiles Press.
1 Foot Presses.
1 Return Tubular Boilers, 16 ft. x 48 in.
1 Vertical " 54 in. x 8 ft.
1 Hoisting Engines, 8 and 10 H. P.
1 No. 2 Hand Milling. Pratt & Whitney.
1 Cutter Grinder, Pratt & Whitney.
1 13-in. stroke Shaper.
1 No. 20 Presses. Bliss.
1 No. 10 in. Horizontal Engine.
1 Die Sinking Machine. Pratt & Whitney.
1 40-in. Bradley Hammer.
Also full line of New Machinery.
New York Agency TAYLOR MFG. CO., Engines, Boilers, &c. Correspondence solicited.
PRESTISS TOOL AND SUPPLY CO.,
P. O. Box 3362. No. 42 Dey St., New York City.

CHARCOAL FURNACE

For Sale.

TWO STACKS. Situated at Nicolet, Wisconsin.

For particulars apply to

ROGERS & CO.,

90 Dearborn St.,

Chicago, Ill.

FOR SALE,

NE OF THE OLDEST FOUNDRIES AND MACHINE SHOPS IN SAN FRANCISCO, CALIFORNIA (ESTABLISHED, 1865).

With facilities ample for making all kinds of machinery. The specialties of the works at the present time are Stationary and Compound Engines, Quartz Crushing and Amalgamating Machinery, together with a large line of Castings and Forgings, with the best facilities on the coast for repairing of all kinds. This is an opportunity seldom offered for any one wishing to engage in the Foundry and Machine business. Terms will be arranged to suit purchaser, or an exchange for city or country property may be effected. In case of purchasers incorporating, a fair proportion of the stock may be taken in payment. In health being the only cause of present proprietor wishing to retire from the business, for further particulars, address **L. A. STARR,** 217 Fremont St., San Francisco.

FOR SALE.

An old-established retail Hardware and Implement store in Central Ohio; stock good and well assorted; invoice about \$10,000; population of town 4000; good reason for selling. Address "HARDWARE," Care of A. O. Jones & Co., Columbus, Ohio.

For Sale.

Heavy Uprigger or Bolt Header, suitable for Bridge Rods and Large Bolts; upset 2½ in. Head to 1 in.; Friction Clutch on it; also 4 in. Bolt "utter," "National." The largest and most complete line of Bolt, Nut and special machinery in the line in the world. Address **THE NATIONAL MACHINERY CO.,** Tiffin, Ohio.

FOR SALE.

The best Retail Hardware store in New England; stock about \$25,000; sales run from \$75,000 to \$100,000 per annum; has been a Hardware store for over 40 years; will pay a net profit of \$3000 to \$4000 a year. Address "N. E. S.," Office of *The Iron Age*, 66 and 68 Duane St., N. Y.

FOR SALE, CHEAP.

One 32 x 54 Horizontal Corliss Engine.
One Pair Harris Corliss Engines, 28 x 60.
One 16 x 24 Corliss Engine.
One 14 x 48 "
Six Horizontal Tubular Boilers, 20-H. P.
One Horizontal Tubular Boiler, 20-H. P.
One No. 1 Sturtevant Blower.
One No. 4 "
Two 50-inch Hawkins Exhausters.
D. B. CRICKSHANK, 243 Dyer St., Providence, R. I.

FOR SALE.

Three-fourths interest in an old-established Hardware Business in a large Western City; doing a good business and a No. 1 location; sales from \$40,000 to \$45,000 per year, and could be increased considerably; Stock all saleable and will invoice about \$25,000; for further information, address "HARDWARE," Office of *The Iron Age*, 13 W. Third St., Cincinnati, O.

Wanted.

A competent Draughtsman accustomed to Steel Works construction and Steam Engineering. Address "DRAUGHTSMAN," Lock Box 1086, Philadelphia, stating salary expected, experience and references.

WANTED.

A first class Foundry Foreman; experience in Iron and Steel preferred. Address "S. & W.," Office of *The Iron Age*, 220 S. 4th St., Philadelphia.

TO MAKE room for larger tool, will sell cheap for cash, a Planer, 48 in. x 48 in. x 12 ft.; in good order. Address **P. O. BOX 2085,** Bridgeport, Conn.

Special Notices.

MACHINERY.

SECOND-HAND, A1 ORDER.

Brown & Sharpe Universal Miller. Large and small.
Pratt & Whitney No. 2 Miller. Lincoln Pattern.
" " Marking Machine.
" " Screw Machine No. 3. B'k Gear.
" " Engine Lathe, 15 in. x 6 ft.
" " 16 in. x 5 ft. Taper.
Putnam Engine Lathes, 17 in. x 6½ ft. No-screw. Rod feed only.
Pond Engine Lathe, 16 in. x 7 ft. Complete.
Harrington " 16 in. x 6 ft. "
Lincoln " 17 in. x 8 ft. "
Bridgeport " 18 in. x 8 ft. "
New Haven " 18 in. x 8½ ft. "
Rowland " 21 in. x 12 ft. "
Ames " 20 in. x 10 ft. "
Blaisdell " 26 in. x 12 ft. "
Perrins " 26 in. x 10 ft. "
Putnam " 42 in. x 16 ft. Rod feed only.
Saunders' 8-inch Pipe-Threading Machine, patent dies. Good as new.
20 in. x 4 ft. Planer. New Haven.
26 in. x 6 ft. " Hendey.
30 in. x 12 ft. " Niles.
42 in. x 12 ft. " N. Y. S. E. Co.
No. 3 Stiles Punch Press.
36-inch Drill. Pratt & Whitney.

Bolt Cutters, Milling Machines, Drills, Shapers, Lathes, Planers, &c., new, and also a line of second-hand machines not mentioned above. State what you want to buy, and we will be glad to correspond with you.
Call and see us.

E. P. BULLARD,

14 Dey Street, New York.

MEYER, KINGSLAND & CO.,

Wholesale Auctioneers,

No. 10 Warren St., New York.

Regular sales of Hardware, Cutlery, &c. Sales cashed promptly. Consignments of goods solicited.

FOR SALE.

Merchantable Hoops, 1½ x No. 16 and No. 17, and 1½ x No. 17, in lengths from 2 to 5 feet.

A. R. WHITNEY & CO.

P. O. Box No. 33, New York City.

Cotton Gin Ribs.

HARDWARE MERCHANTS

and others furnished with materials of all kinds for making and repairing COTTON GINS. RIBS and SAWS for repairing ALL makes of gins. Send for Price List. Address **THE BROWN COTTON GIN CO.,** Manufacturers of Cotton Gins, Feeders and Condensers, New London, Conn.

Vulcan Works, Baltimore, Md.

This old-established Foundry and Machine Shop for sale or lease. Has a complete equipment in all departments. Tools for sale. Send for catalogue. Address as above.

Hardware Business For Sale.

A small, well-assorted stock of Hardware, Tinware and a good set of Tinners' Tools, in town of Locke, Cayuga County; a rare chance for a practical Tinner who has about \$1000 to invest. Address **H. S. DUNNING,** Auburn, N. Y.

FOR SALE.

Large lot second-hand Iron Tanks, from 5000 gals. down, all sizes and shapes.
Large lot new Moulds, 1000 lbs. each.
Large lot new 100 gal. Oil Tanks.
Three very large Cast Iron Kettles suitable for soap or chemical use.
50 tons Red Brass, 500 tons Wrought Scrap Iron.
BUSSENIUS, CUNLIFFE & CO., 12th and Washington ave., Philadelphia, Dealers in Scrap Iron and Old Metals.

Kansas Hardware Business For Sale.

A Retail Hardware Firm in one of the most prosperous towns in Kansas desires to sell out. Their sales range from \$100,000 to \$125,000 per annum. The business is and has been for years making the owners lots of money. Goods are sold at a good profit. The town has about 10,000 population, with several lines of railroad; is growing rapidly and is surrounded by a rich agricultural country. Reasons for selling, both partners are growing old and wish to retire from active business. For further information address "KANSAS HARDWARE DEALER," Care Biddle Hardware Co., Philadelphia, Pa., who will forward letters to us.

FOR SALE.

15 Lever Lard Presses.
Lot of Lard Press Parts and Plates.
1 Cast Iron Sup. reamers.
12 Tons Cast Machinery Scrap.
25 Tons 16-in. Iron Tee Halls, fit to relay.
ROBERT MOFFELY & CO., Iron and Metal Dealers, N. E. cor. 5th and Jefferson Sts

Trade Report.

British Iron and Metal Markets.

The total amount of Anthracite mined thus far in the year 1886 is 952,435 tons, compared with 1,024,655 tons for the same period last year, a decrease of 72,220 tons. The Bituminous trade is unchanged. The Bend and White Coal Mining Co., with a capital of \$2,000,000, was chartered at Harrisburg last week. The Soft Coal fields of Pennsylvania, it is said, were never under a more active development than they are this year. Large tracts are being taken up, and branches are being built from the Pennsylvania and Baltimore and Ohio railroads to lands underlaid with Coal.

The Lehigh Valley Railroad Co. own a line to Geneva, N. Y., and are preparing to build a line of 100 miles, giving them a through line of their own to Buffalo. The Lehigh Valley Coal tonnage last year was 6,312,430 tons, compared with 6,065,967 tons for the previous year.

Trade Report.

New York Iron Market.

American Pig.—The leading topic of conversation among Pig-Iron producers is the statement of output and stocks issued by the American Iron and Steel Association, which we publish and comment upon elsewhere. It proves that there has been a very much greater consumption in the second half of the year 1885, as compared with the first six months. While it will be conceded that the latter half of the year always shows a livelier consumption, it will be observed that the increase noted, of 600,000 tons, is greater by far than any differences due to season can account for. The stocks are exceedingly low, when we consider Anthracite and Bituminous Pig alone and leave out of consideration Charcoal Iron. It is true, on the other hand, that we generally accumulate Iron during the first three or four months of the year, and are probably doing so now, but this is often swept away with the opening of navigation. All this is very encouraging, but it must not be forgotten that since October 1 there has been a very heavy increase in the production, as our monthly statements clearly show. These prove that if we produce throughout the year at the rate at which we entered it 1886 would exhibit a growth of 25% in the output of the Anthracite and Bituminous furnaces combined in the country over that of 1885. These are indications which must not be ignored, and, while the Pig Iron market has a strong undercurrent of confidence, the prospective supply seems ample for all needs so long as any excitement is avoided. During the week the market has been quiet and steady, though it must be noted that some of the furnaces which have recently blown in are actively looking for purchasers. Quotations are unchanged. We quote for Standard brands, tidewater delivery, \$18 @ \$18.50 for No. 1 X Foundry, \$17 @ \$17.50 for No. 2 X Foundry, and \$16 @ \$16.50 for Gray Forge. Outside brands are 50¢ below these quotations.

Scotch Pig.—The market is dull and unchanged. We quote nominally as follows for small lots: Coltness, \$20.50 @ \$21 to arrive; Gartsherrie, \$20 @ \$20.50 to arrive; Shotts, \$20.50 @ \$21 to arrive; Carnbroe and Glengarnock, \$19.50 to arrive; Summerlee, \$20 @ \$20.50 to arrive; Dalmellington, \$19 @ \$19.50 to arrive; Eglington, \$18 @ \$18.50 to arrive, and Clyde, \$18.50 @ \$19 to arrive.

Bessemer Pig.—The market is weaker. We hear of a sale of 5000 tons Solway Hematite at \$19.25 at Hoboken, and of 5000 tons of American at private terms. We quote \$19 @ \$19.50 for Bessemer grades.

Spiegel-Eisen.—The market is quiet. One lot of 3000 tons was sold early in the week at private terms. We quote \$27.50 @ \$28 for English 20%, and nominally \$27 for German 20%.

Bar Iron.—The market is firmer, particularly for Common. We quote for delivery here in round lots: Common Iron, 1.60¢ @ 1.65¢; Medium, 1.65¢ @ 1.75¢, and Refined Iron, 1.80¢ @ 1.9¢, with half extras. Store prices are 1.75¢ @ 1.80¢ for Common, 1.80¢ @ 1.90¢ for Medium, and 1.9¢ @ 2.2¢ for Refined.

Structural Iron.—Inquiries are fair for the season, and there is considerable work in sight. We quote Angles 1.95¢ @ 2¢, delivered, and Tees at 2.25¢ @ 2.35¢ for round lots. Steel Angles are quoted 2.35¢ @ 2.45¢, according to quality. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—It is reported that there is a large order for 7000 tons on the market. We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2½¢ @ 2½¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4½¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2½¢ on dock; Boiler, 3½¢ for Shell, 3¼¢ @ 4¢ for Flange, and 4¼¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—Quotations for the range from ordinary to good grades are as follows: American Tool Steels, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13½¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 4.5¢ @ 6¢; Spring, 2.6¢; Tire, 2.2¢ @ 2.3¢; Open-Hearth and Bessemer Machinery, 2½¢.

Steel Rails.—There is a feeling of uneasiness, and the market is not as strong as it has been. No large lots have been placed during the last week, so that quotations are entirely nominal. It is reported that there will be a meeting of the Rail manufacturers at Philadelphia on the 3d of February. There are several large inquiries on the market, one of them for 20,000 tons for a road in the Southwest.

Steel Wire Rods.—A number of round lots have been sold. We quote \$42 @ \$42.50.

Old Rails.—There have been no sales of American Old Rails of any consequence in this market, which may be quoted nominally \$22 @ \$22.50. English Tees are freely offered for sale shipment at \$22, with no sales reported at that figure. Double Heads are offered at \$22.50.

Old Wheels.—The market is dull and quiet at \$15.50 @ \$16.

Crop Ends.—Crop Ends are scarce at \$22 @ \$22.50.

Scrap.—Scrap is generally held at \$22.40 for No. 1 Wrought from yard, with bids near that figure. We hear of no business.

Rail Fastenings.—These are weaker, and some cutting is reported. We quote 2.20¢ @ 2.25¢ for Spikes, 2.75¢ for Bolts and Square Nuts, 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.7¢ @ 1.75¢ for Splice Bars.

Messrs. Naylor & Co., of 99 and 101 John street, this city, announce to the trade that they are no longer selling agents of the Norway Steel and Iron Co., of Boston, to whom they ask that inquiries and orders be directly sent.

Metal Exchange.

The following transactions are reported as having been made on the floor of the Metal Exchange:

SATURDAY, January 28, 1886.
5 tons Tin, January..... 30.40¢
5 tons Tin, April..... 30.40¢

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, January 28, 1886.

The week past has been one of remarkable dullness, but, considering the season and the somewhat extraordinary weather, little else but dullness could hardly be expected. Nevertheless, there are no signs of weakness, and buyers find it a difficult matter to place orders at figures quoted a week or 10 days ago. The position is somewhat deceptive in this respect. Business has been (or has appeared to be) so dull that buyers got the impression that even if concessions were not granted they could at least easily duplicate their last orders, but they find themselves mistaken. There may be, and doubtless are, exceptions to this rule, but it may be safely asserted that not a single article on the list is lower than it was a week ago, while in the majority of cases there has been a gradual stiffening in prices and in some a slight advance.

Pig Iron.—Shows up remarkably well, and is firmer to-day than at any time since the upward movement commenced. The statistical position is excellent. According to the figures issued by the Iron and Steel Association, stocks decreased during 1885 to the extent of about 180,000 tons. During the last half of the year the decrease was still more striking, being nearly 280,000 tons, notwithstanding a steady and important increase in production during that period. If these figures are correct, and there is no reason to suppose otherwise, the increase in consumption is greater than even the most sanguine persons dared to predict.

Based on the above figures, consumption during the last half of 1885 was in round numbers 2,600,000 net tons, which, according to the same authority, is a larger amount than has ever been produced in any six months in the entire history of the country. Proceeding on the assumption that the figures of the association are correct, it is not unreasonable to suppose that the first half of 1886 will show the heaviest consumption ever known. First, because the average output at the present time is well up to what it was at the best during 1885, and, second, because a largely increased demand is certain within the next 30 or 60 days. In addition to a continuance of orders from the same sources as during the last six months, there will undoubtedly be a large increase from others, such as car-builders, shipbuilders, for elevated railways and for the numerous small industries which will be called into activity in connection with those already named. Fortunately, production has been so steadily on the increase that there is no great danger of inconvenient scarcity, although it is a contingency perhaps not so remote as some may imagine, particularly if the buying fever gets fairly started. Passing to more immediate matters, it may be said that the market is firm, the offerings extremely light and the feeling among holders one of increasing confidence. Good Mill Irons are wanted at \$16, but those who have them for sale ask \$16.50 @ \$17. Once in a while a small lot may be picked up at \$16 @ \$16.25, but it is remarked that those who quote lowest seldom have anything for sale. Foundry Irons are looking better also, and \$18.50 is considered a low figure for a good brand of No. 1 X, \$19 being the general asking price. No. 2 sells at about \$17.50, and shows more activity than usual. On the whole, therefore, while there has been no special movement during the week, the market has gained strength, and the outlook becomes more favorable than at any time since the improvement set in some months ago.

Foreign Iron.—We cannot find that any actual sales have been made, although negotiations have been in progress for several lots. Sellers ask \$20 for Bessemer and \$28 for 20% Spiegel, and show some little disposition to shade prices on firm offers for large lots.

Muck Bars.—There is more doing and prices are firmer, varying from \$28.50 to \$30, according to quality and location of mill.

Blooms.—The demand is improving, and prices are firmer at about the following quotations:

Charcoal Blooms, \$52 @ \$53;
Runout Anthracite, \$42 @ \$43;
Scrap Blooms, \$32 @ \$33, and Ore Blooms, \$34 @ \$35.

Bar Iron.—The demand is fair, and prices firmly maintained. No specially large orders have been offered, but mills have a great deal of work on hand, which, with the current demand, keeps them fairly busy. Some inquiry has been made by car-builders and probably some orders placed, but at figures less than could be accepted in this vicinity. Store price is 1.9¢, firm, and mills 1.85¢, for Best Refined, with every indication of continued firmness.

Plate and Tank Iron.—There has been no great demand of late, but mills have a fair amount of work on hand and might have more if they would accept somewhat lower figures. The disposition is to be very firm, however, as there is a good outlook and prospects of an increasing demand as the season advances. Shipbuilding shows signs of renewed activity, and besides a pretty fair amount of work in smaller vessels two 3000-ton steamers have been given out, with prospects of one or two more at an early date. Under these circumstances and with the increased cost of production prices are firm at about the following quotations:

Ordinary Plate, 2¢ @ 2.1¢; Tank, 2.1¢ @ 2.2¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¢.

Structural Iron.—There is a fair inquiry from the bridge-builders, also from the shipyards, a considerable amount of business having been placed within the past ten days. Manufacturers of Iron are well supplied with orders, and prices are firmly held at about last week's quotations, viz.: 2¢ @ 2.05¢ for Angles; 2.1¢ @ 2.2¢ for Bridge Plate; 2.4¢ @ 2.5¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—The market is in all respects unchanged, demand fair and prices firm. The increasing cost of production renders higher figures almost a necessity, and orders are entered very sparingly at about the following quotations for small lots:

Best Refined, Nos. 26, 27 and 28..... 4¢
Best Refined, Nos. 18 to 25..... 3½¢
Common, ¼¢ less than the above.

Best Bloom Sheets, Nos. 30 to 35..... 5¢
Best Bloom Sheets, Nos. 22 to 25..... 4½¢
Best Bloom Sheets, Nos. 16 to 21..... 4¢
Blue Annealed..... 3½¢
Best Bloom, Galvanized, discount..... 57½¢
Common discount..... 65½¢

Steel Rails.—There is no change of feature, and no great amount of business has been entered within the past couple of weeks. Mills have plenty of work, however, and, as there are many important orders still to be placed, there is no anxiety for new business. Prices are about as last quoted, say \$34.50 @ \$35 at mill, with occasional slight concessions on orders desirable as to time of delivery, &c.

Old Rails.—There is a pretty fair inquiry, but buyers do not respond with much freedom to the high figures now asked. One small lot was taken at \$23, but \$24 is the general asking price for spot lots. A few hundred tons to arrive, now about due, are offered at \$22.50, and lots for February shipment at \$22, but as far as known no sales have been made.

Scrap Iron.—The market is firm, with free sales at rates herewith quoted, viz.: No. 1 Wrought Scrap, \$19.50 @ \$20; No. 2 do., \$13.50 @ \$14.50; Turnings, \$14 @ \$14.50; Old Car Wheels, \$16 @ \$16.50; Old Steel Rails, \$15; Fish Plates, \$23 @ \$23.50; Cast Scrap, \$14.50 @ \$15; do. Turnings, \$10 @ \$10.50. A 1000-ton lot of Basic Steel Scrap is offered to arrive at \$22.50, with \$22 bid.

Wrought-Iron Pipe.—There has been no material change during the week. The demand is satisfactorily active considering the season and weather. Prices are unchanged, and for large lots are as follows: Lap-Welded Black, 60%; Butt-Welded Black, 42½%; Lap-Welded Galvanized, 32½%; Lap-Welded Galvanized, 42½%; Boiler Tubes, 55%.

Nails.—Notwithstanding there were low offerings in some directions last week (which, however, proved to be on qualities not strictly up to the standard), there has been quite a firm holding to prices which have been quoted for several weeks back. Stocks are not accumulating to any great extent, and a fair demand for the spring trade will reduce them to a minimum. Inquiries are coming from the West for large lots, which, it is expected, will result in a heavy business with that section. Under these circumstances the mills are not anxious to push sales at less than regular rates. A fair business for the season is being done, with prices \$2.60 @ \$2.65, and about 10¢ less on carload lots.

Files.—There is a steady business being done in a quiet way. Orders are coming in freely (in one case a single order covered 7000 dozen), showing that dealers intend carrying a larger stock than for some time past. The factories have plenty of work on hand, and all indications are in favor of a continuous good demand. Prices have stiffened somewhat since the first of the year, and are very firm at 55¢ from the new list.

Wood-Working Machinery.—For a long time there has been nothing like the demand which has prevailed for the few weeks just passed. The stock of staple Machinery accumulated during the dull times has been almost completely disposed of, and manufacturers are busily engaged

on new work; their only complaint is the lack of time allowed them to fill orders, which are urgent in nearly every case. Competition still keeps prices down to about what have ruled for many months past, but the present brisk business is expected to bring about some advance before very long.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., January 26, 1886.

The labor troubles are becoming more and more complicated; scarcely has one been settled before a new one is inaugurated. The strike by the coke-workers is becoming more extended, and promises to be the biggest thing of the kind ever attempted in the Coke region. How long it will last or who will win is one of those things that it is difficult to foretell. Both sides appear determined. Mr. H. C. Frick, who represents the Coke syndicate, says they will not meet the demand of the strikers, but the latter appear to be well equipped for a contest and will hold out as long as they can. It is stated that some of the Coke operators have contracts which it is important for them to meet, and it is apprehended that some of them may succumb. There is also a possibility that the strikers may weaken; at the present writing the one is about as likely to weaken as the other. The Edgar Thomson Rail Mill, after considerable negotiations, has been started up again. Concessions were made on both sides—mostly, however, on the part of the men—and it is not likely that there will be any further trouble. The Pittsburgh Bessemer Works, chiefly owned and controlled by the Carnegies, which have been standing idle since Christmas, it was thought had effected a settlement with the men, but additional demands have since been made by the latter, and there is no telling now when the mill will be started. Other Bessemer plants at Wheeling and elsewhere are awaiting the action of the Pittsburgh Bessemer Works, as the wage scale agreed upon, whatever it may be, will be adopted by these plants. The Nail strike still continues, and it looks very much as if the strikers would be beaten. There are now some 780 machines reported in operation west of the mountains non-union, and the production is now almost, if not altogether, sufficient to supply the demand. The probability is that after losing much time, crippling themselves financially and injuring the trade of their employers, they will return to work at the scale offered by the manufacturers. As the days have commenced to lengthen and the weather is more favorable for outdoor work, the various natural-gas companies have commenced to show renewed life, and it is probable that in a few weeks they will be hard at work putting down Pipe. A manufacturer was heard to remark the other day that the advantages of Pittsburgh in this natural gas as fuel were to a considerable extent modified by the higher cost of labor here as compared with other points.

Pig Iron.—While some of the brokers regard the market as giving evidence of weakness, others equally well informed can see nothing in the present or near future to warrant the views of the former in regard to a weakening. The comparative falling off in demand during the past few weeks may be attributed in large part to the fact that many consumers here are well stocked, having bought freely some time ago, and many of the furnaces are sold ahead. In addition to the enhanced cost of Ore, furnacemen call attention to the probability of an advance in the price of Coke and labor as well. Some of them argue that prices, unless the cost of production can be reduced, of which there is not much prospect at present, will have to go still higher. Pittsburgh is regarded as being the cheapest market in the country, and, as a consequence, there is little being offered here by furnacemen at a distance, as they can do better at or nearer home. The greater portion of the Iron consumed here is made by city furnaces, who, for the present, have this market pretty much to themselves. We quote prices as follows:

Neutral Gray Forge..... \$18.00 @ \$16.25, 4 mos.
All-Ore Mill..... 17.50 @ 18.00, 4 "
White and Mottled..... 14.75 @ 15.25, 4 "
No. 1 Foundry..... 17.50 @ 18.00, 4 "
No. 2 Foundry..... 15.50 @ 17.00, 4 "
All-Ore Foundry..... 18.00 @ 18.50, 4 "
Charcoal Foundry..... 20.00 @ 24.00, 4 "
Cold-Blast Charcoal..... 25.00 @ 27.00, 4 "
Bessemer Iron..... 20.00 @ 20.50, 4 "

The ruling price for standard brands of Mill is \$16 cash; we hear of sales of 3000 tons Bessemer Iron at Wheeling at \$20, cash.

Muck Bar.—Continues to move slowly, and, while mills generally are asking \$28, cash, so far as we can learn there have been no sales above \$27, which is much nearer the market than \$28.

Manufactured Iron.—There has been no material change in the situation since the date of our last report. Business continues fairly active and prices are steady, although manufacturers still aver that all kinds of Finished Iron are too low as compared with the cost of the raw article. The indications, however, are that there will be a considerably improved demand next month, and the outlook is generally regarded as being favorable for a good spring trade. It is confidently expected that the railroads will be compelled to buy large quantities, as they will be obliged to build a good many cars and locomotives, in addition to making much-needed improvements and repairs.

Bars.—Bars are still quoted at 1.70¢ @ 1.75¢ for assorted orders, 60 days, 2¢ off for cash. Poor stock can be had below prices quoted.

Nails.—Steel Nails are still quoted at \$2.50, 60 days, 2¢ off for cash, with a rebate of 10¢ per keg on carload lots and upward. There is nothing new to note in connection with the strike, with the exception that manufacturers appear more and more confident of success. The next regular meeting of the Western association takes place in Pittsburgh next month.

Wrought-Iron Pipe.—The demand keeps up well for this season of the year; mills are all pretty well employed, and the outlook is that trade this year will be fully equal to, if it does not exceed, that of 1885. Prices firm, but unchanged. Discount on Black Butt-Welded Pipe, in carload lots and upward, 45%; less than a carload, 42½%; Galvanized do., in carlots, 35%; less, 32½%; Black Lap-Welded Pipe, in carlots, 62½%; less than a carload, 60%; Galvanized do., in carlots, 45%; less than a carload, 60%; Boiler Tubes, 55% off regular list. Two-inch Oil Well Tubing, 13¢ per foot, net; 5½-inch Casing, 40¢; 8-inch Drive Pipe, \$1.30 per foot, net.

Old Rails.—Sales of Old Iron Rails have been made during the week at \$25 per ton; one of our brokers reports sales of several thousand tons at the price quoted. Old Steel Rails have been sold at \$22 @ \$22.50 for mixed lots, and \$23 @ \$23.50 for Long Lengths.

Steel Rails.—New Steel Rails are still quoted at \$35 @ \$35.50, cash, at mill, for Heavy Sections. The Edgar Thomson Mill is again in operation.

Steel.—Steel Nail Slabs are quoted at \$32 @ \$33 per ton; we are reported a sale of 1000 tons at Wheeling at equal to \$32 there; Bessemer Blooms and Billets are quoted at \$33 @ \$35; Steel Rail Ends, \$22 @ \$22.50; Steel Bloom Ends, \$21.50 @ \$22.

Railway Track Supplies.—Trade is quiet, but expected to improve next month. Spikes, 2.25¢, 30 days, delivered; Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ @ 3¢ with Hexagon Nuts.

Old Material.—There is a fair business and prices are steady. No. 1 Wrought Scrap, \$18 @ \$18.50 per net ton; Selected Railway Scrap, \$19.50 @ \$20; Old Car Axles, \$24; Wrought Turnings, \$14; Cast Borings, \$12, gross ton; Old Car-Wheels, \$17; Crucible Scrap Steel, \$23 @ \$24.

Window Glass.—Manufacturers quote discounts as follows: On Single Strength, 75 @ 75 and 5¢; on Double Strength, 75 and 10%.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., COR. LAKE ST., CHICAGO, January 26, 1886.

Hardware.—Encouraging reports are made by jobbers regarding the condition of the market, while traffic and trade are greatly impeded throughout the West by the heavy snows. The direct mail orders from consumers make a good showing under the circumstances. Traveling men report stocks light wherever they have been, and lend hope to the prediction that the demand for goods this spring will be considerably in excess of that for several preceding years. No important changes in price have been lately announced, but the general indications that manufacturers will endeavor to obtain better figures on all lines are being rapidly confirmed. The opening of a branch house in Chicago by the Simmons Hardware Co. is commented on very freely by jobbers and dealers, especially as to its influence on trade for the coming season through the competition that may result. The Simmons Hardware Co. anticipate having their stock of samples in shape and ready for inspection by February 1.

Barb Wire.—The serenity of the market has been somewhat disturbed recently by the refusal of jobbers to adopt prices named by manufacturers, and the continued quotation of 4¢ for Painted Wire and 5¢ for Galvanized is not particularly agreeable to the combination that has been manipulating prices in the last three months. It is stated that brokers have sold Wire in this market below prices named by manufacturers. Jobbers decline to bind themselves to a price that is not sustained by sellers who may be regarded as agents of the mills. This little feature of irregularity has caused buyers to withhold orders somewhat, and the demand has not correspondingly increased during the week with the indications that were visible earlier in the month. The Manufacturers' Association meet again this week at their new office, 94 Washington street, and some further changes are expected.

Nails.—There is apparently no change in the Nail market from what it was a week ago. Iron Nails continue to be quoted nominally at \$2.50 rates, but sales are made as low as \$2.40 from store, the same figures being the price asked in carload lots by jobbers. At the same time jobbers are not inclined to sell Nails in carload lots while inquiries from buyers are constantly increasing. The supply of Steel Nails remains very short, and \$2.65 seems to be the bottom quotation for small lots. They are not offered in carload lots, and it is doubtful whether they can be had from any source in that quantity. Manufacturers are not offering any extra inducements to purchasers, and the prices which they demand for Nails, immediate delivery Chicago, are almost equivalent

to the prices for Nails of the same quality and size in other markets. The demand for Nails is not as strong as it was a week ago. Iron Nails continue to be quoted nominally at \$2.50 rates, but sales are made as low as \$2.40 from store, the same figures being the price asked in carload lots by jobbers. At the same time jobbers are not inclined to sell Nails in carload lots while inquiries from buyers are constantly increasing. The supply of Steel Nails remains very short, and \$2.65 seems to be the bottom quotation for small lots. They are not offered in carload lots, and it is doubtful whether they can be had from any source in that quantity. Manufacturers are not offering any extra inducements to purchasers, and the prices which they demand for Nails, immediate delivery Chicago, are almost equivalent

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alent to the lowest selling price. The opinion prevails that an advance will be made within the next week or 10 days.

Ore.—While it is true that a considerable quantity of Ore has been contracted for, it is said by prominent miners that the contracts have been accepted on conditional prices, which leaves buyers still in the dark as to what they will have to pay. Prices named are held as ranging from \$5.50 to \$6.50 on dock at Cleveland, but these figures are strongly opposed by some of the heavier consumers. It is estimated that about 3,000,000 tons of Ore will be mined during the season, and the fact that pretty much all the surplus that has been carried for several years has been absorbed places the price almost entirely on the basis of cost of mining, shipping and profits expected, which as yet have not been decided upon.

American Pig Iron.—Comparing the week just closed with the previous one, the market shows some falling off in demand and more apathy on the part of buyers. This lull, however, has not affected the firmness of the market, and prices remain firm, with slight advances named on special brands for immediate delivery. Lake Superior Charcoal Irons are selling at \$23 for standard brands, while some furnaces who claim extra quality for their Iron are asking 50¢ per ton more. So far as can be learned, full market price is obtained for all orders. Coke Irons, All Lake Ore, are, if anything, firmer, which may be attributable in part to the strike in the Connellsville Coke region. As many of the furnaces fear that their present stock of Coke will be exhausted before a fresh supply can be obtained—supply and demand being about equal—this gives color to the probability that better figures will be offered. For the best quality \$20 is strictly adhered to, though some sales have been made at 50¢ per ton less for Irons made from mixed Ores. Quotations on Cinder Mixed Irons are unchanged at \$18 @ \$19. On all these grades of Iron except the latter 50¢ per ton is added for late February and March deliveries, but in the majority of cases furnacemen are not encouraging buyers in placing orders in advance of their immediate wants. Ohio Standard Blackbands continue firm at \$22, with choice brands being difficult to obtain in larger lots than 50 tons. Unsettled freight rates are still a disturbing element in the market for Southern Iron. Rumors have it that freights have been advanced \$1 per ton, but no positive information concerning this point has been obtained. Sales agents, however, advanced their quotation on Southern Iron to \$21 for No. 1; \$20 for No. 2; \$18.50 for No. 2½, and the same proportion of advance on Mill Irons. These quotations are made on four months, and can only be nominal. There is little or no demand for the Iron, and we hear of no sales of importance that have been made in this territory in the last two or three weeks. Should these rates prevail it will likely have the effect of keeping the Iron out of this market, unless Ohio furnaces should be unable to supply the Iron that will meet the requirements. Some of them have now given orders to their sales agents to sell no more Iron until March 1, and it is understood that others are sold so far in advance that they refuse to accept orders for anything but immediate delivery.

Merchant Steel.—The change in price and classification by manufacturers has caused a quietness in the market. Buyers as yet have not learned how it will affect their purchasing prices, and are making inquiries on small lots with a view of comparing figures. In the general trade the demand has been light, but dealers are of the opinion that an important change will be brought about by the recent action on the subject. We renew our quotation from store on Open-Hearth and Bessemer Spring Steel at 2¼¢; jobbing rates, 2.6¢; Flat Machinery, 2½¢; Crucible Machinery, 5¢; Crucible Cast Plow Steel, 4½¢; Patented Plow Steel, 5½¢; Standard Plow Steel, 8¢; High Grades, 8½¢ @ 13¢.

Steel Rails.—Makers in this vicinity report that they are having no demand and that the nominal price of \$38 @ \$40 remains unchanged.

Plate and Tank Iron.—The demand for this class of Iron has fallen off some during the week. We make the following quotations from store: Tank Steel, 3¢; Flange do., 4¢; Fire-Bix do., 4½¢; Tank Iron, 2.60¢; Shell do., 3¢; Flange do., 4¢; Angles, 2½¢; Heavy Sheet Irons, Nos. 10 to 14, 2.60¢; No. 16, 2.80¢; No. 18, 2.90¢.

Bar Iron.—Trade in Merchant Bars has been, if anything, more active than in any other branch of Iron during the week. Consumers as a rule are of the opinion that prices are very low, and that before long there must be an advance. For this reason they are placing orders more liberally for present shipment than immediate consumption requires. Makers complain that the price of Old Rails has advanced to a figure where it is almost impossible to convert them into Bars to sell at present price, and the same is said by manufacturers who use Muck Iron. The change which is contemplated is based on the increased cost of raw material, and the causes which have been influenced in preventing an advance are regarded as entirely local, and could be averted if more harmony could be introduced into the jobbing trade. The 1.80¢ rates are demanded on all grades of Bar Iron at the present time, and strictly adhered to on New Puddled

Best Refined stock. On other grades it is confessed that the figures are shaded 5¢, and rumor has it that Iron has been sold at 1¢ less quite recently. Mills claim that they will not sell Iron at less than 1.75¢, base sizes, but would be willing to make a lower price on specifications embodying large quantities of extras. Leading manufacturers have been predicting an advance during the entire month, but thus far the elements which have prevented it control their actions, and prices remain unchanged.

Old Rails.—There is little or no change to note in this market. Buyers have advanced their offering price to \$22.50 @ \$23, but are unable to secure quantities of any size at these figures. Movable stock is pretty well exhausted, and the conditions of the weather make impossible the handling of Rails otherwise available. Holders are asking from \$24 to \$25 per ton, and cannot furnish very large lots at this figure. The North Chicago Rolling Mill Co. quote \$22 at Milwaukee.

Track Supplies.—The demand from railroads is improving. Inquiries are becoming more numerous, and prices named are said to be firm. Spikes, 2¼¢; Splice Bars, 1.80¢; Bolts with Hexagon Nuts, 2.05¢; do. Square Nuts, 2¼¢.

Galvanized Iron.—Makers are having a slightly increased trade, but there appears to be no change in the market price. On some of the very best brands dealers say they have difficulty in getting even small lots, and manufacturers do not care to accept orders for future delivery. Some very low prices are still named, but the general quotations from store are 60¢ off on Juniata and 60¢ and 10¢ off on Charcoal.

Old Wheels.—The demand for Old Wheels has declined within the last week, and prices are said to be a shade below figures named as bottom last week. Stocks are in such shape at the present time that there is no regularity in price, and while some holders are asking \$18.50 @ \$19 we learn of others who are asking \$20 and claim to have made sales at that figure. Contrary to this it is said that Wheels have been offered at \$17.50, so that it is possible that purchases could be made at figures ranging from this figure to \$18.

Scrap Iron.—There has been a fair demand for Scrap and a scarcity reported in extra quantities. On No. 1 Wrought \$19.25 has been named, with sales reported at \$19.50. No. 1 Mill is quoted by sellers at \$15, and No. 2 at \$10. The North Chicago Rolling Mill Co. are offering about \$1 per ton less at Milwaukee. Stocks are becoming quite scarce, and not much of any grade offering. Dealers continue to quote purchasing prices at figures last named.

Pig Lead.—The market was less firm and trading confined to small lots for near shipment. Sales of several hundred tons spot Lead are reported at \$4.40, but it is said that sales have been made at \$4.35. Consumers are not inclined to buy extensively for futures, though dealers are wont to impress them with the limited supply in transit from refiners. All things considered, there is nothing visible that indicates much of a change in price during February.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., Chattanooga, Georgia, January 25, 1886.

Business, like the weather, has relaxed to a considerable extent from its previous congealed condition and resumed in some measure its accustomed activity. Cotton is still very much behind and low in price, which causes collections to be slow in the cotton districts. With this exception the middle belt of the South, where the manufacturing interests are mostly located, shows an activity which appears to grow in interest. Every week some new enterprise is set on foot. There is no doubt the present year will add a large number of new manufacturing concerns to this section. Several new Iron furnaces are talked of, with a probability of some of them taking shape during the present year. The question of the basic process is receiving considerable attention, but nothing has taken definite shape as yet.

Pig Iron.—It would be a difficult task to make a correct diagnosis of this market at the present time. It is true that the spirited demand of some two or three weeks ago has fallen off, and speculative inquiries at present are very few, but the furnaces are not at all uneasy over the situation. Should not another order come in for the next two months there is scarcely a furnace in the district that would experience any inconvenience. Some of them are sold much ahead of this period, and many have certain customers who continue to take their output at fair ruling rates. The demand from the Southern furnaces has been very active during the past week, and orders have been entered from that source alone with the furnaces in this immediate district aggregating about 1900 tons, which would show that they, at least, anticipate a good business early in the season. A matter of considerable interest to the producers of the United States is the fact that should the prices of Pig Iron go higher, or any considerable concession be made on the tariff, most of the furnaces on the Southern seaboard will get their supplies from over the water. A large concern is now negotiating for 150 tons of Scotch Pig per month for the next nine months. They say that at the low price of freight in cotton bottoms the cost will be but a trifle over

what they now pay for American-made Pig. Freights on Pig have been raised about 50¢ per ton to all Northern and Western points, but no change has been made to points East and South. Shipments to Eastern points during the month of December were 4673 tons, against about the same amount the month previous, and so far this month have averaged about the same.

Hardware.—This business is again quite active, and the wholesale dealers are doing fairly well in general lines, and more in goods appertaining to House Trimmings. For Bar Iron the demand is very active, and the same may be said of Nails.

Railroad Material.—For the past few days the demand has been very active, especially for Light Rails ranging up to 30 lb weight. The anticipated change of gauge of nearly all the railroads has caused a large demand for Spikes which the mills have hardly been able to supply.

Cast Pipe.—The works here have now about 3400 tons booked ahead for future delivery, and have refused to entertain offers for as much more. They are now erecting an addition to their works, 75 x 100 feet, and also a pattern and machine shop 50 x 80, three stories high, and will when completed have a capacity of about 140 tons per day. Heretofore they have been extending their trade far into the North and West, but within the last year no less than 28 Southern towns have inaugurated a system of water-works. The products of the works have mainly been taken by these Southern towns, and from indications many more of the smaller towns are likely to introduce a general system of water-works, which will still add largely to the demand for Pipe.

Birmingham.

BIRMINGHAM, Ala., January 25, 1886.

There appears to be a considerable revival in business since the frost gave way. Railroad traffic is heavier than it has been for some time. The banks report comparatively little demand for money by the classes that hard times always brings to them with paper to be discounted. Real estate, which in this manufacturing place is especially quick to respond to industrial and money movements, seems to have stiffened somewhat. Basic Steel is still uppermost in the thoughts and talk of the Iron trade, and every movement of the great Pratt Coal and Iron Co., who have had Mr. Jacob Reese down here, is watched with greater interest than ever. Mr. Reese left several days ago, but not until he had empowered the Pratt Co. to control his patent right in this country. Upon the heels of his departure the same concern bought 200 acres of desirable Iron land for the sake of a better supply of Ores to the furnaces for which they are building engines here in Birmingham, and which will feed their basic plant if any is constructed. The president of the Pratt Co. says he thoroughly investigated the ground of all the attacks on Mr. Reese's rights, and that if he had the basic plant in operation he should not at all apprehend interference from the courts. He also expresses himself as thoroughly convinced of the practicability of making good Steel here, and making it profitably, by the basic process. So, altogether, there is a very general feeling that the day of Steel making from Alabama Iron is not distant. The Pratt people say they do not desire to prevent others in this country from using the basic process.

Pig Iron.—About all there is to report is a heavier rate of production, and the main reason of this is that the furnaces are again able to get their materials regularly. The furnace that had to bank some 10 days ago for want of Coal has started, and elsewhere things are going on about as they were before the holidays. Shipments are heavy again, and the demand for the near future—the only kind that is seriously considered here now—is very satisfactory. It seems to be a unanimous sentiment among manufacturers that on long-time transactions the probabilities would be very much in buyer's favor.

Rolled Iron.—Having made the necessary repairs, the rolling mills are again in operation, with their business ahead of their product because of the stoppage. Inquiries and orders come abundantly enough, but transactions do not vary much from old prices.

Cast Pipe.—The Pipe product of the Birmingham Iron Works is now sold for some 90 days ahead, at an advance of \$2, which is to say at \$28 @ \$32. The tone of the inquiries that come now is still very satisfactory at the works, too.

Nails.—Are doing nothing new; Helena asking \$2.45 and Brierfield \$2.50.

Miscellaneous.—At least one foundry and machine shop here is making figures on some of the heaviest work ever offered it. The foundry of the Linn Iron Works turned out something new a few days ago in a Steel Casting, the first ever made in Birmingham. It was made from Old Rails, a material with which Mr. L. R. Brooks, the superintendent, was preparing to experiment several months ago, when Mr. Robert Masters, of Columbus, Ga., made it known that he had just succeeded in melting it. The Birmingham Chain Works have been prevented from starting by the trouble at the rolling mills. They will make their first Chains this week.

Coal and Coke.—Although the Coal and Coke operators are not incommencing their customers any more, they are still doing a big business—considerably the heaviest they

have done this winter. The freight irregularities by which Alabama Steam and Grate Coals were shut out of certain territory by East Tennessee fuels earlier in the season have been righted, the East Tennessee, Virginia and Georgia Railroad restoring rates sufficiently to meet other roads which reduced a little, and the trade is supplied normally again.

Building Materials.—Pretty well everything that house-builders use is looking up. Yellow Pine Lumber to the local trade is higher by \$2 per 1000 than it was six days ago. Shingles have advanced proportionately, and Brick, which sold a while back as low as \$6.50 per 1000, are up some 75¢. Locally promises of a building boom in the spring are giving a brighter look to everything of this sort. At an annual meeting of the Southern Lumber Association here last week the reports from everywhere showed a greatly improved demand, with a big business in prospect, but it was decided not to change prices yet.

Cincinnati.

JANUARY 25, 1886.

Pig Iron.—The market in the past week has ruled steady in prices, with some increase of transactions, part to supply future wants, but mostly for present uses. The feeling among furnacemen in the West and South is generally to pursue a conservative course in the disposition of their output. It is reported from all quarters that inquiries and orders are coming in for supply through the year that meet with but little encouragement from the producers. It is thought that the supply and demand will be about equal. Quotations below are f.o.b. here, four months, or less the freight to Cincinnati if orders are filled direct from furnaces; 50¢ per ton discount for cash on time prices.

CHARCOAL FOUNDRY.	
Hanging Rock, Best, No. 1, 4 mos.	\$21.00 @
Hanging Rock, Good, No. 1, 4 mos.	19.50 @ 20.50
Hanging Rock, Good, No. 2, 4 mos.	19.00 @
Southern No. 1, 4 mos.	18.00 @ 18.50
Southern No. 2, 4 mos.	17.00 @
COKE FOUNDRY.	
Ohio and West Pennsylvania, No. 1, 4 mos.	18.50 @ 19.50
Ohio and West Pennsylvania, No. 2, 4 mos.	17.00 @ 18.00
Southern No. 1, 4 mos.	18.50 @
Southern No. 2, 4 mos.	17.00 @
SILVER-GRAY SOFTENERS.	
Hanging Rock, Best, No. 1, 4 mos.	19.00 @
Hanging Rock, Good, No. 1, 4 mos.	18.50 @
Hanging Rock, Good, No. 2, 4 mos.	17.50 @ 18.50
Hanging Rock, No. 3, 4 mos.	16.50 @ 17.00
Other makes.	16.00 @ 17.50
CAST IRON.	
Hanging Rock Cold-Blast, 4 mos.	25.00 @
Hanging Rock Warm-Blast, 4 mos.	19.00 @ 22.00
Southern Warm-Blast, 4 mos.	17.50 @ 19.00
Southern Warm-Blast Standard, 4 mos.	23.00 @ 25.00
Georgia Cold-Blast, 4 mos.	25.00 @
RANGE OF GRADES AND MAKES, SALES REPORTED.	
Rails.	19.00 @ 19.50
Wheels.	18.50 @ 17.00
Wrought.	17.00 @ 18.00
Cast, sales reported.	1.35 @ 1.65

Louisville.

W. B. BELKNAP & Co., Louisville, under date of January 25, report as follows: The state of the market is that of quiescence; there is no decided movement either way. The advances already made in most goods seem to be satisfactory alike to buyer and seller, to manufacturer and jobber. At the same time the spring trade has not developed enough to show how stable they may be or whether susceptible of further improvement. The weather has continued cold, and the heavy river ice has prevented resumption of navigation. While this is reasonable of course curtails the consumption for farm and building material to a great extent, and hence the demand for these goods must suffer delay. There is nothing, however, discouraging, so far as we can see, except possibly the silver agitation, which prevents free investment of capital. We learn that many long-time contracts, such as leases, &c., are being drawn payable in gold, which of itself will go in a measure to correct the evils we might labor under if a double standard prevailed. It seems a pity that some of the bonanza kings of the West could not strike a few gold mines instead of silver mines. We think this would do more to change their minds as to the propriety of a gold standard than any amount of argument in Congress. The passage of the Presidential succession bill without opposition is something to congratulate the country on, and now a measure in the nature of a national bankrupt act free from the abuses of the last, wherein creditors' money was largely eaten up by the extra fees allowed the assignee, will be eminently desirable. One depressing element is the falling off in many quarters of the railroad earnings. This could hardly be otherwise, however, when all is taken into consideration. In anticipating the advances of January very little was left to begin the year on, and there has been virtually an embargo since the year opened, by reason of the extreme cold, snow, &c. If present rates can be maintained an improvement must certainly manifest itself soon. Advances in rates are very material, and good faith on the part of the main lines is all that is necessary to bring in fair returns. The Baltimore and Ohio fight is unfortunate just at this juncture, as it would seem to indicate irreconcilable hostility. In the South the ordinary state of affairs seems reversed; the agricultural element is not so prosperous as the manufacturing. The low prices for farm products have discouraged the farmers somewhat, and they are asking more or less extension of their factors. The manufacturing interests, on the contrary, seem to be in a flourishing condition.

Sheet Iron.—The trade on this has extended through the season more evenly than usual, as buyers were frightened off by an advance in the fall and when the drop came were afraid to take hold.

Bar Iron.—There is no change to note. The advance of \$3 per ton seems firmly held, and the virtuous resolution on the part of

many mills to use only Muck Bar indicates the turning of a new leaf coincident of the beginning of the new year, not to mention the advance in Old Rails.

Steel.—The various articles manufactured of the lower grades of Steel, such as Crow-Bars, Harrow Teeth, &c., have been marked up fully 1/4¢.

Nails.—There is comparatively little doing in the way of Nails. It is hardly time for them to move in large quantities, but should there be even an average spring demand they must certainly be scarce on the present basis of production, as the price did not go low enough on this turn to stimulate speculative buying of these lots. The buying has been on a small scale and from day to day.

Wire.—Is firm. Manufacturers are offering no concessions here, and there are lots held by speculators which are put on the market at a cut of 1/4¢ for large immediate purchases.

The volume of general trade is fully up to the average, and while some are asking indulgence in the matter of payments the state of the trade on the whole is good.

GEORGE H. HULL & Co., of Louisville, report to us as follows under date of January 25: The market for Hot-Blast Pig Iron is at a stand still as far as sales are concerned. Freight rates South have been advanced 50¢ per ton, and the furnaces have added this advance to their limit on prices to Ohio River points. The large sales of the last three months have supplied the buyers and contracted the furnaces for nearly all the Iron they will make for several months to come. Car-Wheel Irons have been more active, and large sales have been made, which have caused a still further advance. We quote for cash as below:

PIG IRON.	
Southern Coke, No. 1 Foundry.	\$18.00 @ \$18.50
" " " " " " " "	17.00 @ 17.50
" " " " " " " "	16.50 @ 17.00
Hanging Rock Coke, No. 1 Foundry.	18.00 @ 18.50
" " " " " " " "	17.00 @ 17.50
" " " " " " " "	16.50 @ 17.00
Southern Charcoal, No. 1 Foundry.	20.00 @ 21.00
" " " " " " " "	19.00 @ 20.00
Silver Gray, different grades.	16.50 @ 17.00
Southern Coke, No. 1 Mill, Neutral.	16.00 @ 16.50
" " " " " " " "	15.00 @ 15.50
" " " " " " " "	14.00 @ 14.50
" " " " " " " "	13.00 @ 13.50
White and Mottled, different grades.	13.00 @ 14.00
Southern Car-Wheel, Standard brands.	25.00 @ 26.00
Southern Car-Wheel, other brands.	20.00 @ 21.00
Hanging Rock, Cold-Blast.	27.00 @ 28.00
" " " " " " " "	21.00 @ 22.00

Old Material.—The market for Old Material is very strong, and sales have been made at the advanced figures, and we revise quotations accordingly. Old Rails can probably be sold at \$22, but we know of no lots that are offered less than \$22.50. Old Wheels, also, are held much higher than buyers are willing to pay. We quote for cash as below:

Rails, per ton.	\$20.50 @ \$22.00
Wheels, per ton.	15.00 @ 16.00
No. 1 Wrought, per 100.	70 @ 75
No. 1 Country Wrought, per 100.	50 @ 60
No. 1 Cast, per 100.	40 @ 55
Boilers, cut, per 100.	60 @ 65
Boilers, uncut, per 100.	40 @ 45
Axles, per 100 lb.	90 @ 95
Flues, Tanks and Sheets, per 100.	35 @ 38
Burned Scrap, per 100.	30 @ 35

Detroit.

CHARLES HUMBOLDT & Co., dealers in Pig Iron, Detroit, Mich., report, under date of January 25, as follows: We have arrived at the period where manufacturers think that all they have to do is to wait. All branches of the Iron business here have been very dull, and we should judge from reports that the same existed nearly everywhere during the past week. How long this is going to continue is a question. There is no doubt about the fact that many of the large buyers have bought, but there are lots of smaller buyers who have little or no stock, and they will be obliged to buy, and I think the present outlook here will tend to have them make as large purchases as they can. It is almost impossible to find a manufacturer now buying on the hand-to-mouth basis. There were some contracts let to our car concerns here which will exacerbate business. The new company for manufacturing Cast Pipe have their foundry almost ready for operation. It is built on the most improved plans, and we think naturally will do a large business. There is also the announcement made that another car concern is to be established here, occupying the works of the old Peninsular Car Co., which could be readily put into operation with some slight repairs. Detroit seems destined to be a very large manufacturing point. It is now. Almost all classes of material can be purchased here about as cheaply as anywhere in the country, and on many the prices are very much lower than elsewhere. The outlook for business is very bright, and all there seems to be needed is a start to make the month of February as good as December was. Substantially we repeat our quotations of last week, as follows:

Lake Superior Charcoal, Nos. 1, 2 and 3.	\$23.00 @ \$24.00
Lake Superior Charcoal, Nos. 4, 5 and 6.	24.00 @ 25.00
Lake Superior Coke, All Ore.	21.50 @ 22.50
Lake Superior Coke, Cinder Mixed.	20.00 @ 20.50
Standard Ohio Blackband.	21.50 @ 22.50
Southern No. 2.	19.00 @ 20.00
Southern Silvery Open.	18.50 @ 20.00
Southern Silvery Close.	18.00 @ 19.50
No. 1 Southern Mill.	17.50 @ 18.50
American Old Iron Rails.	25.00 @ 26.00
Old Wheels.	18.00 @ 20.00

St. Louis.

W. H. SHIELDS, 305 Olive street, St. Louis, reports, under date of January 25: The market is quiet with no disposition to cut. I quote nominally as follows:

CHARCOAL FOUNDRY.	
Missouri.	\$17.50 @ \$18.50
Southern.	19.50 @ 19.50
COAL AND COKE FOUNDRY.	
Missouri.	17.50 @ 18.50
Southern.	17.50 @ 18.50
American Scotch.	18.00 @ 21.00
MILL IRON.	
Missouri.	16.00 @ 17.00
Southern.	16.00 @ 16.50
CAR-WHEEL AND MALLEABLE IRONS.	
Southern.	22.00 @ 23.00
Lake Superior.	21.00 @ 21.00
SCRAP, ETC.	
Old Wheels.	16.00 @ 17.00
Old Rails.	21.50 @ 22.00
Connellsville Coke (East St. Louis).	5.30 @

Trade Report.

General Hardware.

The volume of business is fair, and in many lines manufacturers report a much more satisfactory condition of things, and a better outlook than for several years. The changes in price during the past week have not been many, but are generally in the direction of advances. The special features of the market are noted below.

BARB WIRE.

The market is very quiet, but firm, at the recent advance. We quote 4.75 cents for carload lots of Four-Point Barb Wire, Galvanized, 4 1/2 cents for 3-ton lots and 5 cents for 1-ton lots. These quotations cover only such wire as will be shipped by March 1.

NAILS.

There has been a flurry in Nails during the week, and considerable business has been done at low prices, with the result that those who have been free sellers for some time past have been filled up for the present. They are asking higher prices now, and the market is stiffer. A good many of the leading mills have stood by quietly and have not swerved from their policy of piling up rather than selling. We quote Iron Nails from store, \$2.35 @ \$2.45, and carload lots, \$2.25.

LOCKS.

The Lock market is more regular than it has been for a long time, and the new prices are much more closely adhered to than heretofore. Extras are given with much less liberality, and a disposition is evinced, even by the manufacturers who are known as having of late made the lowest prices, to maintain with fair firmness the new quotations. So that altogether the market is in much better shape, and the wisdom of the association in putting prices on what is intended to be a solid basis, so that the regular quotations may have some significance, is generally admitted. Although in doing this a material reduction in nominal prices was made, which had temporarily a slightly depressing effect on the market, it is generally conceded that its effect has been, on the whole, decidedly beneficial, as it is more injurious to the tone of the market to have prices irregular than to have them low.

Advices from some of the manufacturers outside of the combination indicate that they also regard with satisfaction the recent change of prices, and uniformly express the opinion that it will not result in diminishing the amount of production of the non-associated manufacturers. One prominent manufacturer refers to the action as having a tendency probably to make them push their business the more vigorously, and another alludes to it as satisfactory, as it will probably prevent a good deal of the cutting in prices which was carried on before the change, while a third house intimates that there will be no difficulty in meeting the new prices. Some of the manufacturers will probably issue revised lists and others are not intending to do so at present. Alluding to the effect of the new prices, one of our correspondents says:

In our opinion the recent changes will prove beneficial to the manufacturers, preventing cutting of prices. Hitherto the difference in price between the cheap and the medium and better grades of Locks was too great, resulting in the sale of comparatively few good Locks. We feel confident it will be the means of the manufacturers receiving orders for first-class Locks, on which there is still a small margin left, and on the whole we are perfectly satisfied with the new deal.

Concerning the general situation another house, referring to the probable policy of the outside makers, remarks:

We have made no change in our lists and discounts, and do not intend to unless compelled. Our inventory stock on hand just made is the lightest in three years, and we see no valid reason why ruling prices for 1885 should not be maintained. In fact, we had anticipated a substantial advance in some goods. We do not think the action of the association will diminish the production of outside makers. They will all stay in the market so long as they have a profit, and no longer, and whenever there is a margin will go in again. That is the way we feel. If there is an excess of goods the manufacturers have it. We never knew the retail trade as bare as now, and the same can be said of many leading jobbers, and they will not be tempted by lower prices to buy more than they want.

MISCELLANEOUS PRICES.

The Hartman Steel Co., Beaver Falls, Pa., issue a circular illustrating Wire Nails from 2d. fine to 60d., with the number to the pound, as well as of the same sizes of Steel Cut Nails. Their base price is announced as 4 1/4 cents per pound for rod, to 60d., advances for the smaller sizes being made, in accordance with the card adopted by the manufacturers and recently given in these columns.

A very excellent movement is on foot among the leading jobbers of the West, looking to a maintenance by them of any advances which may be made by the manufacturers. Its object is by concerted action to enable them to reap the benefit of such advances in the sale of goods bought at the old prices, while at the same time a better tone will be given the market and greater regularity given to prices. This is certainly on all accounts a most desirable effort. Jobbers are, in the nature of the case, compelled to bear losses through the decline of stock on hand, and this has been a serious drawback during the long season of shrink-

ing prices, and it is only right that by agreement among themselves and the co-operation of the manufacturers they should have the benefit of such advances as may occur. If this effort results, as we hope it may, in inducing such houses generally to sell their stocks at the advanced prices, it will be a gain not only to them, but to the whole trade.

The manufacturers of Steel Goods are adhering firmly to the advanced prices and naming discount 60 and 10 and 5 to the general trade. Many of them are full of orders and unable to deliver goods in the near future. Some of the jobbers show a disposition to sell the goods at about former prices, instead of taking advantage of the advance made by the manufacturers. There is, however, a firm feeling in the market for this line of goods, and it is hoped that the jobbers generally will follow the advance which has been made by the manufacturers.

The Wire market is very firm at the advanced prices alluded to last week, in making which the leading manufacturers have united. The probability of a further advance is also alluded to by some.

Cast Butts are held generally at the advanced prices, but some jobbers houses are still selling them, presumably from old stock, at about former prices.

At the late meeting of the American Block Makers' Association in this city, George S. Adams, 389 Howard street, Detroit, Mich., was chosen president. It was decided to continue the association, whose working is referred to as having been satisfactory and conducive to the interests of manufacturers and the trade generally. The former scale of prices was continued, with a slight change by which a small advance was made in the extreme price, the quotation to the retail trade remaining as before. The anticipation is expressed by the members of the association that the organization is on a solid footing and that prices will be steady the coming year.

The Unadilla Machine Works, Unadilla, N. Y., quote Teller's Kitchen Knife at \$1.25 per dozen, subject to a discount to the retail trade of 10 per cent.

E. S. HULBERT & CO., Bernardston, Mass., issue the following list of Butcher Knives, &c. This season they have added to their line:

5 1/2-inch and 6 1/2-inch Butcher Knives.
5 1/2-inch and 6 1/2-inch Sticking Knives.
14 and 18 inch Hotel Slicers.
10 and 12 inch Cheese Knives with sharp points.

They are also making 6, 6 1/2 and 7 inch Butcher Knives with cocoa handle, designed for the house-furnishing trade, which are described as made from the same quality of double shear steel as their Beech-Handle Knives, and fully warranted. They also advise us that they are making an extra quality Paring Knife. Their list is as follows, subject to a discount of 40 and 10 per cent., with an additional discount of 2 per cent. for cash.

Butcher Knives.	Per doz.
5 1/2-inch.....	\$3.08
5 1/2-inch.....	3.50
6-inch.....	3.80
6 1/2-inch.....	4.50
7-inch.....	5.30
8-inch.....	6.00
9-inch.....	7.80
Sticking Knives.	Per doz.
10-inch.....	\$6.00
11-inch.....	12.00
12-inch.....	15.00
13-inch.....	16.50
14-inch.....	18.00
Fork Knives.	Per doz.
10-inch.....	\$6.00
11-inch.....	12.00
12-inch.....	15.00
Sticking Knives.	Per doz.
5 1/2-inch.....	\$3.08
5 1/2-inch.....	3.50
6-inch.....	4.30
6 1/2-inch.....	4.90
7-inch.....	5.60
Skinning Knives.	Per doz.
5-inch.....	\$3.08
5 1/2-inch.....	3.50
6-inch.....	4.30
6 1/2-inch.....	4.90
7-inch.....	5.60
Miscellaneous Knives.	Per doz.
12-inch Splitting Knives, Heavy Back.....	\$18.00
12-inch Cooks' Leaning Knives.....	15.00
Bonemongers.....	15.00
Jewellers' Chamis Knives.....	3.50
Sandusky Fish Knives, Assorted.....	3.50
Paring Knives.....	1.75
6-inch Butcher Knives, Cocoa Handle.....	5.00
6 1/2-inch Butcher Knives, Cocoa Handle.....	5.00
7-inch Butcher Knives, Cocoa Handle.....	5.00
14-inch Hotel Slicers, Cocoa Handle.....	18.00
18-inch Hotel Slicers, Cocoa Handle.....	24.00
Carving Knives, Royal Slicers, Cocoa Handle.....	7.00
Bread Knives, Cocoa Handle.....	7.00
Carving Knives and Forks.	Per Pair.
.....	1.50
Cheese Knives, Plated.	Per doz.
10-inch, Square Point, Cocoa Handle.....	\$9.00
12-inch, Square Point, Cocoa Handle.....	12.00
10-inch, Sharp Point, Cocoa Handle.....	9.00
12-inch, Sharp Point, Cocoa Handle.....	12.00

Butter and Lard Spades, Plated.

	Per doz.
3 x 6 inch.....	\$7.30
3 x 8 inch.....	6.50

ITEMS.

John H. Graham & Co., 113 Chambers street, New York, have recently been appointed agents for the following manufacturers, whose goods they will carry in stock and on which they are authorized to make the manufacturers' best terms: Barton Bell Co., East Hampton, Conn., manufacturers of Hand, House, Call, Sleigh Bells, &c., and Gay & Parsons, Augusta, Me., manufacturers of the Interchangeable Screw-Drivers Set, Double Action Ratchet Screw-Drivers, &c.

Weaver, Goss & Co., Rochester, N. Y., issue a circular announcing that owing to the increase of their trade they are compelled to seek more commodious quarters, and shall remove about February 1 to Nos. 49 and 51 North St. Paul street, where they will have ample room and a large stock. It is

announced that the management of the firm will remain as heretofore. They have re-organized in the form of a joint stock company, and will hereafter be known as the Weaver & Goss Hardware Co.

The Southern White Lead Co., of St. Louis, under date of January 14, announce to the trade that for the convenience of their customers in and around Chicago they have established a supply depot at No. 90 Franklin street, in that city, where they will keep a full stock of Southern Company White Lead, and also their Red Lead. Invoices will be sent from St. Louis, as usual.

Announcement is made that the copartnership heretofore existing between A. Travis Wells and Morton Minot, under the firm name of Wells & Minot, Brockport, N. Y., was dissolved January 1 by mutual consent. The liabilities of the firm have been assumed by Mr. Minot, to whom accounts due the firm are to be paid and who will continue the business.

The Manhattan Stamping Works, 509 to 515 First avenue, New York, issue a circular containing memorandum of goods on hand which they propose to sell before moving to their new factory, 105 to 111 North Third street, Brooklyn, E. D. It is intimated that if any of these goods should be required satisfactory prices can be made. It includes a line of Stamped, Pieced and Japanned Ware.

B. B. Noyes & Co., Greenfield, Mass., issue a catalogue displaying their line of Hardware for Children's Carriages, Kitchen Hardware, Garden and Floral Tools, &c. A variety of these goods are illustrated, with descriptions and list prices.

Announcement is made that the copartnership heretofore existing between Sidney Shepard, C. Sidney Shepard, Augustus F. Tripp and James G. Forsyth, under the firm name of Sidney Shepard & Co., of Buffalo, has been dissolved by mutual consent by the withdrawal of Sidney Shepard from the copartnership. All the debts are to be paid to, and all liabilities are assumed and will be paid by, the remaining partners—C. Sidney Shepard, Augustus F. Tripp and James G. Forsyth—who will continue the business under the firm name of Sidney Shepard & Co. Mr. Shepard, in a card to the trade, thus announces his withdrawal:

As I am about to retire from the firm of Sidney Shepard & Co., and will be succeeded in it by my son, Charles Sidney Shepard, I wish to say that the capital remaining in the firm is the same as heretofore. From my long association with the members of the present firm, and my faith in their probity, I consider them entitled to the same confidence and consideration as in the past. Our readers will regard this announcement with much interest, concerning as it does so prominent a house, and while Mr. Shepard, so long and widely known as merchant and manufacturer, will bear with him in his retirement the well-merited esteem of the trade, the best wishes for their continued prosperity will be given to the house that still bears his name.

We are in receipt of catalogue of the Pierce Hardware Co., Rocky Hill, Conn., for whom T. F. Cheriton Hardware Co., 122 Chambers street, New York, are sole agents in this city. Having taken this agency and added thereto their own special line of Anti-Friction Hangers, Grindstone Fixtures, Hay Fork Pulleys, &c., the T. F. Cheriton Hardware Co. intimate that they are prepared to furnish on a much larger scale than formerly this line of goods and at very favorable prices.

The Leffingwell Automatic Coal Sieve, of which we recently gave a description among our Hardware Novelties, is manufactured by Charles Leffingwell, of Newark, N. J. This Sieve is expected to retail at \$2.50, and is sold to the trade at \$18 per dozen, net cash, f. o. b. Newark, N. J. Rights to manufacture and sell are for sale.

We would call the attention of the trade to the large trade sale of Hardware and House-Furnishing Goods to be held by Messrs. Haydock & Bissell, at their salesroom, 83 Chambers and 65 Reade streets, on Thursday and Friday, February 4 and 5. (See advertisement on page 20). Following this a large trade sale of Table and Pocket Cutlery is announced for February 18 and 19. The sale of February 4 and 5 will comprise extensive invoices of Hardware and House-Furnishing Goods from the manufacturers, and will no doubt attract a large number of buyers. The entire catalogue, we are assured, will be sold without reserve.

The A. F. Pike Mfg. Co., Pike Station, N. H., have appointed John H. Graham & Co., 113 Chambers street, New York, their agents, and are carrying with them a full line of Seythe Stone, Washita, Arkansas, Hindostan, Labrador, Turkey and Chocolate Oilstone, Sandstone, Razor Hones, Emery Table Hones, Knife Sharpeners, Seythe Rifles, &c. In calling attention to the quality of these goods they allude especially to their Oilstone, which they refer to as equal to any on the market.

The Straubinger Sifter Mfg. Co., Lafayette, Ind., of whose Henry Four-Piece Sifter we gave a description last week, are manufacturing under license from the J. M. Hunter Sifter Mfg. Co., and are referred to as having new machinery and being in a position to prosecute their enterprises energetically. E. W. Straubinger, who has been with Hibbard, Spencer, Bartlett & Co. for some time and still retains his connection with them, is president, and W. R. Patton, secretary.

George P. Clark, Windsor Locks, Conn., manufacturer of Hardware Specialties, Ma-

chinery, &c., advises us that he is adding new styles to the different lines of Truck Wheels, Trucks, Exhaust and Ventilating Fans made by him. He is about to put on the market another style of Exhaust Fan, which is described as suitable for placing in a window or other aperture in the side of a building for drying or ventilating purposes. He is also making another style of Truck Wheel for mill and warehouse use, which with other goods will be described in his catalogue soon to be issued.

The Ludlow-Saylor Wire Co., St. Louis, Mo., issue their illustrated and descriptive catalogue No. 17. In it is displayed their extensive line of Wire Cloth, Wire Rope, Wire and Iron Fences, Railings, Sand, Coal and Ore Screens, Counter and Office Railings, &c., of which they are manufacturers, and attention called to the fact that they are jobbers in Iron, Brass and Copper Wire, Brass Rods, Tubing, Sheet Brass, &c. In their introductory circular to the trade they allude to the fact that it has been some time since the issue of their last illustrated catalogue, during which time they have added many new goods, besides making improvements in the old ones. This catalogue is a convenient and fully-illustrated pamphlet of 100 pages.

C. W. DUNLAP & CO.,

249 to 253 Plymouth street, Brooklyn, N. Y., issue their discount sheet No. 2, January 15, applying to their catalogue and price list of August, 1884. In it attention is called to the following changes in list prices:

Cake Turners on Page 6, Change List as follows:
Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

The following additional goods which have recently been added to their line are also referred to, and the list prices and discounts given as below:

Carpet Stretchers.
No. 3, same pattern as No. 2, but larger, \$4.50 per doz.
Mincing Knife.
No. 40, Ex. Heavy, 2 Blade, \$24 per gross.....dis. 10%
Bread Knife.
No. 6, for Hotel and Restaurant. Whole length 18 inches. Extra Heavy, Best Cast-Steel Blade, \$14 per doz.
Oyster Knives.
No. 5, Wood Handle, same as Boston Pattern, but Heavy Blade, \$2.50 per doz.....dis. 10%
No. 7, D. C. Pattern, All Solid Steel, Heavy, \$4 per doz.
Ice Picks.
No. 6, Fine Cast Steel, Slender Blade, 5 inches long, \$12 per gross.....dis. 15%
Pinching Irons.
We make a Short one (whole length 7 inches). Price same as others.
Box Chisels.
Solid Octagon. Tool Steel, Extra Quality.
8 10 12 14 16 in. long.
\$6.50 7.00 7.50 8.00 12.00 per doz.....dis. 15%
Cane Ferrules.
Pat. Steel Plug Ends, ass'd, \$6 per gross.....dis. 25%

The following is their discount sheet applying to the catalogue, in which it will be seen that an advance of about 10 per cent. is made on many of the goods. This advance they refer to as required by the cost of manufacture, and in announcing it they allude to the satisfactory condition of trade, as indicated by the orders that are being received. In addition to the discounts named it is stated that customers who pay immediate cash on receipt of goods are given a further discount of 5 per cent.:

Page.	Discount.
3, 4, 5, Mincing Knives.....	10
6, Cake Turners.....	10
7, Kitchen Forks.....	15
8, Bread Knives.....	15
9, Ham Saw Knives.....	10
10, Family Meat Saw.....	10
11, Kitchen Squeezers.....	10
12, Can Openers.....	10
13, Sardine Shears.....	10
14, Oyster Knives.....	10
15, Clam Knives.....	10
16, Kitchen Hammers.....	10
17, Bread Hammer.....	15
18, Nail Hammer.....	20
19, Carpet Stretchers.....	25
20, Carpet Stretcher Handles.....	20
21, Pickers.....	20
22, Tack Claw.....	20
23, Kitchen Tongs.....	20
24, Skewers.....	20
25, Cork Saws.....	10
26, Vegetable Slicers.....	10
27, Clothes Line Reels.....	10
28, Clothes Poles.....	10
29, Ice Picks.....	15
30, Ice Chisels.....	15
31, Ice Mallets.....	10
32, Ice Hatchets.....	10
33, Ice Tongs.....	15
34, Chisels.....	25
35, Vegetable Slicers.....	25
36, Lager Beer Extensions.....	15
37, Bung Starts.....	10
38, Mallets.....	10
39, Wall Scrapers.....	25
40, Mudgers.....	15
41, Ice and Snow Scrapers.....	15
42, Hammer Tries.....	15
43, Cover Lifters.....	10
44, Furnace Rakes.....	10
45, Pinking Irons.....	15
46, Pinching Irons.....	20
47, Fluting Scissors.....	20
48, Carling Tongs.....	25
49, Currier Pins.....	25
50, Nail Sets.....	20
51, Nail Sets.....	20
52, Square Reamer.....	20
53, Screw-Drivers.....	20
54, Cold Chisels.....	20
55, Dividers.....	20
56, Compasses.....	15
57, Saw Sets.....	15
58, Plumbers' Scrapers.....	20
59, Bee Goggles.....	20
60, Bee Goggles.....	20
61, Bee Goggles.....	20
62, Bee Goggles.....	20
63, Bee Goggles.....	20
64, Bee Goggles.....	20
65, Bee Goggles.....	20
66, Bee Goggles.....	20
67, Bee Goggles.....	20
68, Bee Goggles.....	20
69, Bee Goggles.....	20
70, Bee Goggles.....	20
71, Bee Goggles.....	20
72, Bee Goggles.....	20
73, Bee Goggles.....	20
74, Bee Goggles.....	20
75, Bee Goggles.....	20
76, Bee Goggles.....	20
77, Bee Goggles.....	20
78, Bee Goggles.....	20
79, Bee Goggles.....	20
80, Bee Goggles.....	20
81, Bee Goggles.....	20
82, Bee Goggles.....	20
83, Bee Goggles.....	20
84, Bee Goggles.....	20
85, Bee Goggles.....	20
86, Bee Goggles.....	20
87, Bee Goggles.....	20
88, Bee Goggles.....	20
89, Bee Goggles.....	20
90, Bee Goggles.....	20
91, Bee Goggles.....	20
92, Bee Goggles.....	20
93, Bee Goggles.....	20
94, Bee Goggles.....	20
95, Bee Goggles.....	20
96, Bee Goggles.....	20
97, Bee Goggles.....	20
98, Bee Goggles.....	20
99, Bee Goggles.....	20
100, Bee Goggles.....	20

30, Chalk Line Reels.....	15
31, Segar Knives.....	15
32, Solid Funnel.....	20
33, Box Scrapers.....	20
34, Box Chisels.....	15
35, Merchandise Hooks.....	15
36, Cotton Hooks.....	15
37, Hay Hooks.....	15
38, Chisel Handles.....	10
39, Brad Awi Handles.....	10
40, File Handles.....	20
41, Screw-Drivers.....	10
42, Solder Copper Handles.....	10
43, Brick Trowel Handles.....	10
44, Brass Ferrules.....	25
45, Malleable Ferrules.....	25
46, Cane Ferrules.....	25
47, Plane Handles.....	10
48, Saw Handles.....	10
49, Garden Rakes.....	50x10
50, Socket Garden Rakes.....	50
51, Ladies' Rakes.....	25
52, Boys' Rakes.....	25
53, Hoe Rakes.....	30
54, Garden Trowels.....	30
55, Transplanting Trowels.....	30
56, Weeding Forks.....	30
57, Farmers' Hoes.....	30
58, Ladies' Hoes.....	25
59, Weeding Hoes.....	25
60, Excelsior Weeding Hook.....	30
61, Scuffle Hoes.....	30
62, Edging Knives.....	30
63, Pruning Saw.....	30
64, Garden Reel.....	30
65, Boys' Spades.....	25
66, Garden Spades.....	25
67, Garden Forks.....	25
68, Garden Sets.....	25
69, Boys' Sets.....	25
70, Floral Sets.....	25
71, Pruning Shears.....	30
72, Garden Sticks.....	30
73, Sand Spades.....	30
74, Rake and Hoe Handles.....	30
75, Ice Axes.....	10

THE LOCKWOOD MFG. CO.,

South Norwalk, Conn., who are not in the Lock Association, issue the following revised list prices of their Locks, Latches, &c., which corresponds, it will be observed, with the Lock Association's list of December 18, 1885. The discount is 50 per cent., with an additional 2 per cent. for cash:

No.	Price per doz.	No.	Price per doz.	No.	Price per doz.
1.....	\$0.545	38.50	890, 2 keys.....	18.....	\$1.50
2.....	1.90	43.50	21.....	19.....	3.00
3.....	2.25	550	22.....	20.....	4.00
4.....	3.00	550	23.....	21.....	4.00
5.....	4.00	555	24.....	22.....	4.00
6.....	4.75	555	25.....	23.....	5.50
7.....	5.25	560	26.....	24.....	5.50
8.....	5.50	560	27.....	25.....	5.50
9.....	5.50	565	28.....	26.....	5.50
10.....	\$4.00	565	29.....	27.....	5.50
11.....	4.50	570	30.....	28.....	5.50
12.....	4.50	570	31.....	29.....	5.50
13.....	5.00	575	32.....	30.....	5.50
14.....	5.00	575	33.....	31.....	5.50
15.....	5.50	575	34.....	32.....	5.50
16.....	5.50	580	35.....	33.....	5.50
17.....	5.50	580	36.....	34.....	5.50
18.....	5.50	585	37.....	35.....	5.50
19.....	5.50	585	38.....	36.....	5.50
20.....	5.50	590	39.....	37.....	5.50
21.....	5.75	700	40.....	38.....	5.50
22.....	5.00	715	41.....	39.....	5.50
23.....	5.00	715	42.....	40.....	5.50
24.....	5.00	715	43.....	41.....	5.50
25.....	5.00	715	44.....	42.....	5.50
26.....	5.00	715	45.....	43.....	5.50
27.....	5.00	715	46.....	44.....	5.50
28.....	5.00	715	47.....	45.....	5.50
29.....	5.00	715	48.....	46.....	5.50
30.....	5.00	715	49.....	47.....	5.50
31.....	5.00	715	50.....	48.....	5.50
32.....	5.00	715	51.....	49.....	5.50
33.....	5.00	715	52.....	50.....	5.50
34.....	5.00	715	53.....	51.....	5.50
35.....	5.00	715	54.....	52.....	5.50
36.....	5.00	715	55.....	53.....	5.50
37.....	5.00	715	56.....	54.....	5.50
38.....	5.00	715	57.....	55.....	5.50
39.....	5.00	715	58.....	56.....	5.50
40.....	5.00	715	59.....	57.....	5.50
41.....	5.00	715	60.....	58.....	5.50
42.....	5.00	715	61.....	59.....	5.50
43.....	5.00	715	62.....	60.....	5.50
44.....	5.00	715	63.....	61.....	5.50
45.....	5.00	715	64.....	62.....	5.50
46.....	5.00	715	65.....	63.....	5.50
47.....	5.00	715	66.....	64.....	5.50
48.....	5.00	715	67.....	65.....	5.50
49.....	5.00	715	68.....	66.....	5.50
50.....	5.00	715	69.....	67.....	5.50
51.....	5.00	715	70.....	68.....	5.50
52.....	5.00	715	71.....	69.....	5.50
53.....	5.00	715	72.....	70.....	5.50
54.....	5.00	715	73.....	71.....	5.50
55.....	5.00	715	74.....	72.....	5.50
56.....	5.00	715	75.....	73.....	5.50
57.....	5.00	715	76.....	74.....	5.50
58.....	5.00	715	77.....	75.....	5.50
59.....	5.00	715	78.....	76.....	5.50
60.....	5.00	715	79.....	77.....	5.50
61.....	5.00	715	80.....	78.....	5.50
62.....	5.00	715	81.....	79.....	5.50
63.....	5.00	715	82.....	80.....	5.50
64.....	5.00	715	83.....	81.....	5.50
65.....	5.00	715	84.....	82.....	5.50
66.....	5.00	715	85.....	83.....	5.50
67.....	5.00	715	86.....	84.....	5.50
68.....	5.00	715	87.....	85.....	5.50
69.....	5.00	715	88.....	86.....	5.50
70.....	5.00	715	89.....	87.....	5.50
71.....	5.00	715	90.....	88.....	5.50
72.....	5.00	715	91.....	89.....	5.50
73.....	5.00	715	92.....	90.....	5.50
74.....	5.00	715	93.....	91.....	5.50
75.....	5.00	715	94.....	92.....	5.50
76.....	5.00	715	95.....	93.....	5.50
77.....	5.00	715	96.....	94.....	5.50
78.....	5.00	715	97.....	95.....	5.50
79.....	5.00	715	98.....	96.....	5.50
80.....	5.00	715	99.....	97.....	5.50
81.....	5.00	715	100.....	98.....	5.50
82.....	5.00	715	101.....	99.....	5.50
83.....	5.00	715	102.....	100.....	5.50
84.....	5.00	715	103.....	101.....	5.50
85.....	5.00	715	104.....	102.....	5.50
86.....	5.00	715	105.....	103.....	5.50
87.....	5.00	715	106.....	104.....	5.50
88.....	5.00	715	107.....	105.....	5.50
89.....	5.00	715	108.....	106.....	5.50
90.....	5.00	715	109.....	107.....	5.50
91.....	5.00	715	110.....	108.....	5.50
92.....	5.00	715	111.....	109.....	5.50
93.....	5.00	715	112.....	110.....	5.50
94.....	5.00	715	113.....	111.....	5.50
95.....	5.00	715	114.....	112.....	5.50
96.....	5.00	715	115.....	113.....	5.50
97.....	5.00	715	116.....	114.....	5.50
98.....	5.00	715	117.....	115.....	5.50
99.....	5.00	715	118.....	116.....	5.50
100.....	5.00	715	119.....	117.....	5.50
101.....	5.00	715	120.....	118.....	5.50
102.....	5.00	715	121.....	119.....	5.50
103.....	5.00	715	122.....	120.....	5.50
104.....	5.00	715	123.....	121.....	5.50
105.....	5.00	715	124.....	122.....	5.50
106.....	5.00	715	125.....	123.....	5.50
107.....	5.00	715	126.....	124.....	5.50
108.....	5.00	715	127.....	125.....	5.50
109.....	5.00	715	128.....	126.....	5.50
110.....	5.00	715	129.....	127.....	5.50
111.....	5.00	715	130.....	128.....	5.50
112.....	5.00	715	131.....	129.....	5.50
113.....	5.00	715	132.....	130.....	5.50
114.....	5.00	715	133.....	131.....	5.50
115.....	5.00	715	134.....	132.....	5.50
116.....	5.00	715	135.....	133.....	5.50
117.....	5.00	715	136.....	134.....	5.50
118.....	5.00	715	137.....	135.....	5.50
119.....	5.00	715	138.....	136.....	5.50
120.....	5.00	715	139.....	137.....	5.50
121.....	5.00	715	140.....	138.....	5.50
122.....	5.00	715	141.....	139.....	5.50
123.....	5.00	715	142.....	140.....	5.50
124.....	5.00	715	143.....	141.....	5.50
125.....	5.00	715	144.....	142.....	5.50
126.....	5.00	715	145.....	143.....	5.50
127.....	5.00	715	146.....	144.....	5.50
128.....	5.00	715	147.....	145.....	5.50
129.....	5.00	715	148.....	146.....	5.50
130.....	5.00	715	149.....	147.....	5.50
131.....	5.00	715	150.....	148.....	5.50
132.....	5.00	715	151.....	149.....	5.50
133.....	5.00	715	152.....	150.....	5.50
134.....	5.00	715	153.....	151.....	5.50
135.....	5.00	715	154.....	152.....	5.50
136.....	5.00	715	155.....	153.....	5.50
137.....	5.00	715	156.....	154.....	5.50
138.....	5.00	715	157.....	155.....	5.50
139.....	5.00	715	158.....	156.....	5.50
140.....	5.00	715	159.....	157.....	5.50
141.....	5.00	715	160.....	158.....	5.50
142.....	5.00	715	161.....	159.....	5.50
143.....	5.00	715	162.....	160.....	5.50
144.....	5.00	715	163.....	161.....	5.50
145.....	5.00	715	164.....	162.....	5.50
146.....	5.00	715	165.....	163.....	5.50
147.....	5.00	715	166.....	164.....	5.50
148.....	5.00	715	167.....	165.....	5.50
149.....	5.00	715	168.....	166.....	5.50
150.....	5.00	715	169.....	167.....	5.50
151.....	5.00	715	170.....	168.....	5.50
152.....	5.00	715	171.....	169.....	5.50
153.....	5.00	715	172.....	170.....	5.50
154.....	5.00	715	173.....	171.....	5.50
155.....	5.00	715	174.....	172.....	5.50
156.....	5.00	715	175.....	173.....	5.50
157.....	5.00	715	176.....	174.....	5.50
158.....	5.00	715	177.....	175.....	5.50
159.....	5.00	715	178.....	176.....	5.50
160.....	5.00	715	179.....	177.....	5.50
161.....	5.00	715	180.....	178.....	5.50
162.....	5.00	715	181.....	179.....	5.50
163.....	5.00	715	182.....	180.....	5.50
164.....	5.00	715	183.....	181.....	5.50
165.....	5.00	715	184.....	182.....	5.50
166.....	5.00	715	185.....	183.....	5.50
167.....	5.00	715	186.....	184.....	5.50
168.....	5.00	715	187.....	185.....	5.50
169.....	5.00	715	188.....	186.....	5.50
170.....	5.00	715	189.....	187.....	5.50
171.....	5.00	715	190.....	188.....	5.50
172.....	5.00	715	191.....	189.....	5.50
173.....	5.00	715	192.....	190.....	5.50
174.....	5.00	715	193.....	191.....	5.50
175.....	5.00	715	194.....	192.....	5.50
176.....	5.00	715	195.....	193.....	5.50
177.....	5.00	715	196.....	194.....	5.50
178.....	5.00	715	197.....	195.....	5.50
179.....	5.00	715	198.....	196.....	5.50
180.....	5.00	715	199.....	197.....	5.50
181.....	5.00	715	200.....	198.....	5.50
182.....	5.00	715	201.....	199.....	5.50
183.....	5.00	715	202.....	200.....	5.50
184.....	5.00	715	203.....	201.....	5.50
185.....	5.00	715	204.....	202.....	5.50
186.....	5.00	715	205.....	203.....	5.50
187.....	5.00	715	206.....	204.....	5.50
188.....	5.00	715	207.....	205.....	5.50
189.....	5.00	715	208.....	206.....	5.50
190.....	5.00	715	209.....	207.....	5.50
191.....	5.00	715	210.....	208.....	5.50
192.....	5.00	715	211.....	209.....	5.50
193.....	5.00	715	212.....	210.....	5.50
194.....	5.00	715	213.....	211.....	5.50
195.....	5.00	715	214.....	212.....	5.50
196.....	5.00	715	215.....	213.....	5.50
197.....	5.00	715	216.....	214.....	5.50
198.....	5.00	715	217.....	215.....	5.50
199.....	5.00	715	218.....	216.....	5.50
200.....	5.00	715	219.....	217.....	5.50
201.....	5.00	715	220.....	218.....	5.50
202.....	5.00	715	221.....	219.....	5.50
203.....	5.00	715	222.....	220.....	5.50
204.....	5.00	715	223.....	221.....	5.50
205.....	5.00	715	224.....	222.....	5.50
206.....	5.00	715	225.....	223.....	5.50
207.....	5.00	715	226.....	224.....	5.50
208.....	5.00	715	227.....	225.....	5.50
209.....	5.00	715	228.....	226.....	5.50
210.....	5.00	715	229.....	227.....	5.50
211.....	5.00	715	230.....	228.....	5.50
212.....	5.00	715	231.....	229.....	5.50
213.....	5.00	715	232.....	230.....	5.50
214.....	5.00	715	233.....	231.....	5.50
215.....	5.00	715	234.....	232.....	5.50
216.....	5.00	715	235.....	233.....	5.50
217.....	5.00	715	236.....	234.....	5.50
218.....	5.00	715	237.....	235.....	5.50
219.....	5.00	715	238.....	236.....	5.50
220.....	5.00	715	239.....	237.....	5.50
221.....	5.00	715	240.....	238.....	5.50

Sliding Door Locks—Double Doors.
No. 160, 4 1/2 x 3 1/2 inches, Plain Brass Front and Bolts, with 4 Flush Cup Escutcheons.
No. 165, 4 1/2 x 3 1/2 inches, Plain Bronze Front and Bolts, with 4 Flush Cup Escutcheons.
No. 170, 4 1/2 x 3 1/2 inches, Ornamental Brass Front and Bolts, with 4 Ornamental Flush Cup Escutcheons.
No. 175, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front and Bolts, with 4 Flush Cup Escutcheons.

No. 180, 4 1/2 x 3 1/2 inches, Astragal, Plain Brass Front and Bolt, with 4 Flush Cup Escutcheons.
No. 185, 4 1/2 x 3 1/2 inches, Astragal, Plain Bronze Front and Bolt, with 4 Flush Cup Escutcheons.
No. 190, 4 1/2 x 3 1/2 inches, Astragal, Ornamental Iron Bronze Front and Bolt, with 4 Ornamental Flush Cup Escutcheons.

No. 195, 4 1/2 x 3 1/2 inches, Astragal, Ornamental Iron Bronze Front and Bolt, with 4 Flush Cup Escutcheons.

Keys for Locks Nos. 160, 165, 170, 175, 180, 185, 190, 195, are Class No. 125.

Mortise Front Door Locks and Vestibule Latches.
No. 540, 4 1/2 x 3 1/2 inches, Lacquered Iron Front, Iron Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 540 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 540.

No. 545, 4 1/2 x 3 1/2 inches, Lacquered Iron Fronts, Brass Bolts, Plated Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 545 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 545.

Keys for Locks Nos. 540, 545, are Class No. 115.
No. 540 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 540 1/2.

No. 550, 4 1/2 x 3 1/2 inches, Plain Bronze Fronts and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 550 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 550.

No. 555, 4 1/2 x 3 1/2 inches, Plain Bronze Fronts and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 555 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 555.

No. 560, 4 1/2 x 3 1/2 inches, Plain Bronze Fronts and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 560 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 560.

No. 565, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 565 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 565.

No. 570, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 570 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 570.

No. 575, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 575 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 575.

No. 580, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 580 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 580.

No. 585, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front and Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 585 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 585.

No. 590, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 590 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 590.

No. 595, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 595 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 595.

No. 600, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 600 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 600.

No. 605, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 605 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 605.

No. 610, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 610 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 610.

No. 615, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 615 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 615.

No. 620, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 620 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 620.

No. 625, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 625 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 625.

No. 630, 4 1/2 x 3 1/2 inches, Ornamental Iron Bronze Front, Brass Bolts, Bronze Thumb Knob and Plate, Nickel Key, 1 Tumbler on both Bolts, 2 Small Nickel Night Keys, 12 Changes.

No. 630 1/2, 3 1/2 x 3 1/2 inches, Vestibule Latch to match Lock No. 630.

satin paper is put on. The box should always be longer than it is wide, so that one can distinguish at a glance which is the long way of the box, for where the width is nearly as great as the length the lid is liable to be put on crossways of the box and thus split nearly all of the corners of the lid open, the box thus remaining an eyesore until all of the goods are sold from it. If the shape of the article to be boxed is such that the box can be made perfectly square this is avoided. A great nuisance is the telescope box, such as is used for boxing Wostenholme's Cutlery, and by some manufacturers of Files. If an article is taken out of such a box to show a customer, and the salesman is so unfortunate as not to sell the article, being in a hurry to put the article back in the box he will not fold the paper inside as it left the packing-room, and as a consequence the box is disintegrated, and when the cover is forced on the telescope cover is usually split from one end to the other and in this condition cannot be used. I have no doubt that more bad words have been used from this cause than were ever uttered in putting up stove-pipes. There are other serious objections to this style of box, but the above should be sufficient to make the telescope box a thing of the past. Now, as to the paper covering for Hardware boxes, I think no color can compare with plain green satin paper. The Scotch plaid paper used by manufacturers of Spoons, Glimmers, Auger Bits and some other goods might do for a lining of cheap trunks and satchels, but I cannot see how it ever came to be used as a box covering, unless it originated in the hand-box. It is certainly not appropriate for

larger than is absolutely required to hold a given number of Chisels, as frequently they cannot be repacked by the clerk as closely as they were at the factory, and the consequence is that the lid has to be forced in the slot, and a broken or split lid, or the box split where it is slotted for the lid, is the result. I would suggest that the word *Mortise* be used as a substitute for *Framing* on label of Chisels, as the two words *Firmer* and *Framing* look so much alike that very frequently when in a hurry a box of one may be opened before you discover it is the other that you desire. I think Augers could be put in wood boxes similar to Chisel boxes with good advantage, also Horse Raps. I would be glad to be one to contribute \$5 for the printing of such suggestions as the foregoing, to be printed and addressed, "Hints to Manufacturers," with a large number of signatures of leading men in the Hardware trade appended. Of course the wishes of an individual would scarcely be heeded, but if the manufacturers felt it was the desire of the many, the manufacturers are too progressive a class of men not to take the hint. Let the dealers ask in their orders for goods of such brands or manufacture as those who have endeavored to get up attractive, as well as substantial, boxes and labels, and the cure will soon be effected.

ARRANGEMENT OF HARDWARE STORES.
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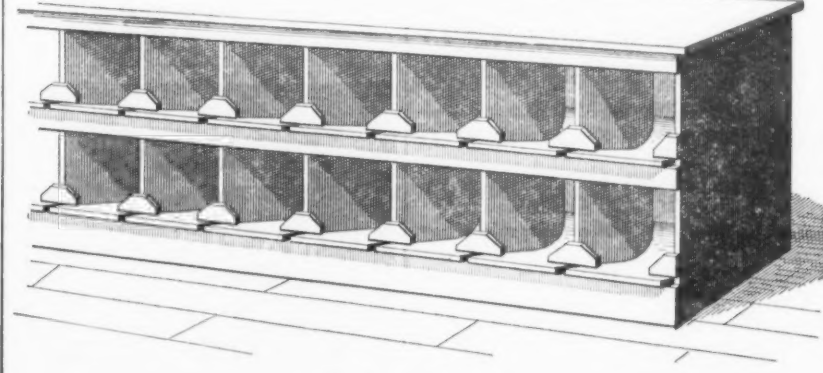


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L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches
MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.
ESTABLISHED IN 1839.



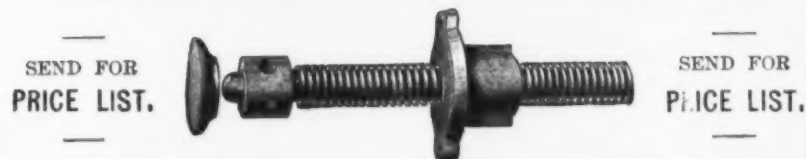

Patented July 6, 1880. Patented July 8, 1884.
Registered March 31, 1874.

Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.
Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

J. C. McCARTY & CO.,
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Sole Agents.

Illinois Iron and Bolt Co.,
MANUFACTURERS OF
HOUSE-RAISING SCREWS.



PRESS SCREWS,

FOR PRESSING

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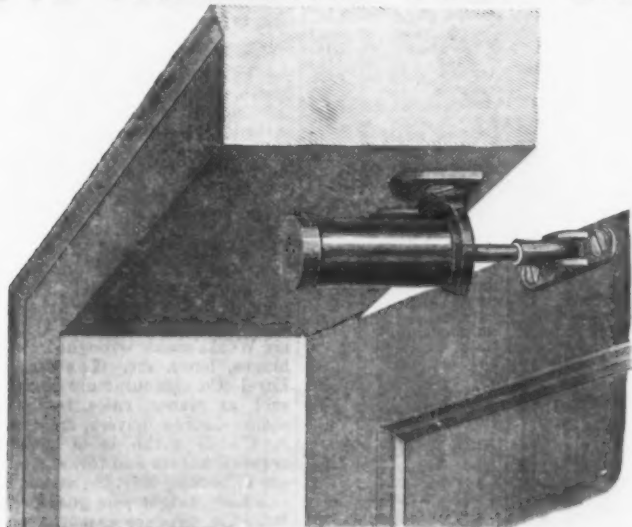
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Locomotive, Track, Wagon and Bell Base,
Tripod and Carrying Ratchet

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NOS. 20 TO 26 MAIN STREET,
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WATTS & MANUFACTURING & CO.,
480 PEARL STREET, NEW YORK,
SOLE MANUFACTURERS OF THE
WATTS PNEUMATIC DOOR CHECK.

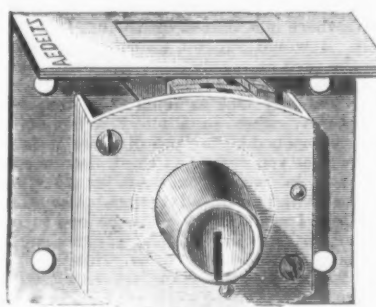


The Latest Improved, Most Simple and Only Reliable Door Check
Now on the Market.

It can be applied to either side of the Door or on the casing overhead. In fact, the only universal Air Door Check made that can be sold over the counter, not requiring an expert to put it on. Can be applied by anybody, and are sold at about half the price of other Checks. Catalogues and Price Lists furnished on application.

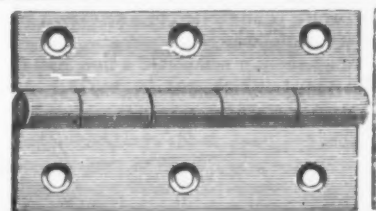
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The Only Manufacturers of a Complete Line of
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SEND FOR CIRCULAR. — UPRIGHT DRILLS.

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J. C. McCARTY & CO., Agents,
97 Chambers and 81 Reade Sts.,
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W. & J. TIEBOUT,
MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.
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ALWAYS GIVES THE
UTMOST SATISFACTION.

Main Belting Co.
Manufacturers of
THE LEVIATHAN
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BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.
Made to any Length,
Width and Strength.
Main Driving Belts.
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No Cross Joints, Un-
affected by Damp-
Chills well to the Pulley.
Has no equal. In fact,
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248 East Randolph St.
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EGG BEATERS.

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NOVEL.

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CLOTHES DRYER

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Laundry and Kitchen.

10 Arms: 29 Inches Long.
Of white ash, finished in oil, set
in bright japanned castings.

Price, Each, \$1.00.
One dozen in crates. Weight, 68
pounds.
Liberal discount to Trade.

John Campbell,
Manufacturer of
HARDWARE SPECIALTIES,
Manchester, N. H.

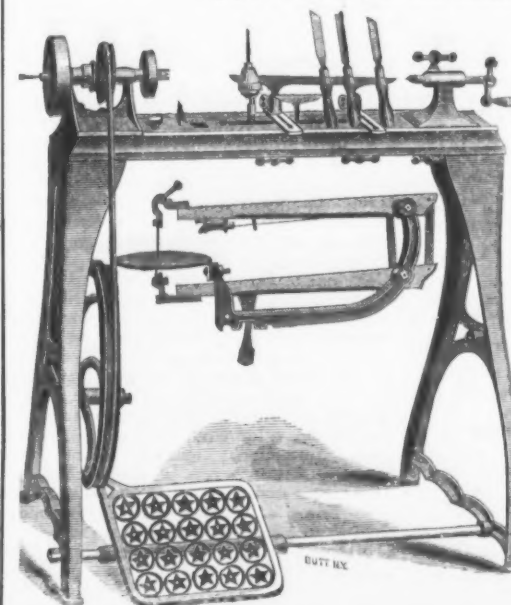
SEELEY, CHURCH & COMPANY,
PACIFIC COAST AGENTS

FOR EASTERN MANUFACTURERS

IRON, STEEL, HARDWARE, &c.

Correspondence solicited.
No. 309 California St. (Rooms 6 and 7), San Francisco, Cal.

WE HAVE ADDED THE
GOODELL LATHE AND SAW,
As seen in this Cut, to our Line of **SCROLL SAW**
SUPPLIES for the coming year.



It is by far the best Lathe in
market. We have also made
great improvements on the

Lester, Rogers and Cricket Saws.

Another generation of boys is
coming to the front, so that the
demand for these Saws is fast
increasing, and seems likely to
be as large as it was eight years
ago. Dealers can increase their
fall trade by laying in a stock.

Goodell Lathe and Tools... \$10.00,
Scroll Saw Attach'm't, extra 2.00,
Lester Saw and Lathe... 10.00,
Rogers Saw, No. 1... 3.50,
Cricket Saw, all Iron... 2.50,
Bracket Sets, Nickel Plated,
per doz... 15.00,
Bracket Sets, Pleasure and
Profit, per doz... 10.00.

We are headquarters in New
York for Wood, Designs and
supplies of all kinds for bracket
sawyers. Our Star Bracket
Blades are superior to any others
in use, and are in demand in
many other countries.

There is a regular trade dis-
count to all dealers.

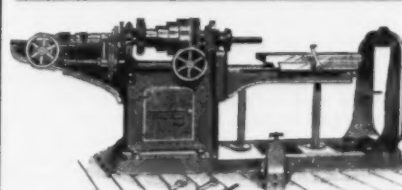
MILLERS FALLS CO.,
74 CHAMBERS STREET, NEW YORK.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
WAREHOUSE
97 CHAMBERS AND 81 READE STREETS NEW YORK.
DURRIE & McCARTY, Sole Agents.

H. B. SEIDEL, President.
W. HASTINGS, Vice-Pres. and Gen'l Mgr.
E. T. CANBY, Sec. and Treas.
THE SEIDEL & HASTINGS CO.
WILMINGTON, DELAWARE,
New York Office, No. 221 Pearl, Corner Platt Street,
MANUFACTURERS OF

BEST CHARCOAL
BOILER PLATES,
AND PLATE IRON GENERALLY.
ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we
manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when
desired. One hundred and sixteen tests of this iron, made during the last three years by the
U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808
pounds to the sectional square inch, and an average reduction of area of the fractured
section of 30% per centum. Our prices are as low as the production of a good article will admit of.



BETTS MACHINE CO.,

Wilmington, Del.,

MAKERS OF

IMPROVED

MACHINE TOOLS.

BRASS AND IRON SHIP CHANDLERY HARDWARE.

Yacht Fixtures, Nickel-Plated Canoe Trimmings, Cheapest and Best Side Lights in the Mar-
ket, Awning Hardware. Specialties in Brass made to Order.

THE SHELTON BRASS HARDWARE CO., Birmingham, Conn.

Send for Illustrated Catalogue.

NEW YORK WAREHOUSES: 95 Chambers St. CHICAGO WAREHOUSES: 177 Lake St.

STRONGEST ACME WRENCH AND BEST.



ALL STEEL CASE-HARDENED JAWS. WARRANTED. MANUFACTURED BY
OWSLEY BROS. & MARBLE, 784 to 794 Madison St., CHICAGO, U. S. A.
Description and Price List Furnished upon Application.

PURE TURKISH EMERY.
WALPOLE EMERY MILLS,
South Walpole, Mass.

INDUSTRIAL ITEMS.

MAINE.

It is said that Boston parties have leased the iron works and nail factory of the Pembroke Iron Co. and will start them up in the spring. The above works have been idle since July, 1884.

NEW HAMPSHIRE.

The directors of the Franconia Iron Co. organized at Concord on the 15th, with John H. Barron, president; C. M. Amsden, vice-president; L. D. Stevens, treasurer and clerk.

The Haley Mfg. Co., recently organized in Concord and composed of Boston and Concord capitalists, have purchased the buildings and land occupied by the Concord Carriage Co., and will immediately fit up the premises for the manufacture of shade rollers. The sum paid was \$10,000, and the property cost originally \$25,000.

The S. C. Forsyth Machine Co., Manchester, at the annual meeting held last week, declared a dividend of \$2 per share.

MASSACHUSETTS.

The factory at North Hanson formerly occupied by the Standard File Co. has been leased by Kingston parties, and will be used as a tack manufactory.

The Washburn & Moen Mfg. Co., Worcester, are having made a 600 horse power condensing engine from plans furnished by the Armstrong & Sims Engine Co., Providence, R. I.

The main building of the G. W. & F. Smith Iron Foundry Co., Boston Highlands, was destroyed by fire last week, together with its contents, incurring a loss of between \$20,000 and \$30,000. Insurance about \$15,000.

C. H. Brown, Fitchburg, has recently furnished a 250-horse-power engine for the Mason & Hamlin Organ Co., Boston, and one of the same size in the Cleghorn Mill, Fitchburg. He is making a 400-horse-power engine for the American Rubber Co., and one of half that capacity for the L. B. Smith Rubber Co.

RHODE ISLAND.

During the past two months the Brown & Sharpe Mfg. Co., of Providence, have received more orders than for some time previous. The works are running full time, employing 450 hands.

D. B. Cruickshank, of Providence, has just shipped a 15-horse-power boiler to the Standard Oil Co., Burlington, Vt., and a No. 3 J. B. Davis pump to the American Indurated Fibre Co., of Mechanicsville, N. Y. He reports business as improving.

CONNECTICUT.

Several of the knife-shop hands at Bradleyville work until 9 p. m.

A Bridgeport concern employs 75 people in manufacturing a sewing machine which is held in the hand and used like a hair clipper.

The Southington Cutlery Co.'s employees have, on account of the four or five weeks' strike of the grinders and finishers, sustained a loss of about \$4000.

The wire-drawers' strike at New Haven, which was begun six months ago at E. S. Wheeler & Co.'s East Haven mill, is ended. The strikers claimed to have gained their point, while the firm say that both sides have made concessions.

NEW YORK.

The old Morrison foundry, at Green Island, has been opened as a machine shop by Andrew Rose.

NEW JERSEY.

The Watson Machine Co., of Paterson, who build all kinds of machinery, shafting, &c., are now employing about 175 hands. They are exporting considerable work, largely hydraulic presses, sugar machinery and shafting, to Cuba, South America and Mexico.

PENNSYLVANIA.

The Chesapeake Nail Co., of Harrisburg, have given notice of a 10 per cent. reduction of nailers' wages, to take effect on Monday, the 25th inst. The nailers have not yet decided whether to accept it or not.

The Berwind-White Coal Mining Co., of Philadelphia, capital stock \$2,000,000, were chartered last week to mine coal in Clearfield, Center, Blair, Cambria and Jefferson counties. The company will have control of 17 collieries. The directors are Charles F. Berwind and Allison White, of Philadelphia, and Edward J. Berwind, of New York.

The Glasgow Iron Co., of Pottstown, have become an interested party in the Ellis & Lessig Steel and Iron Co., they having purchased some \$60,000 worth of the stock of that corporation.

The upper shops of the Pennsylvania Railroad Co., at Altoona, have been ordered upon 10 hours' time.

The York Rolling Mill is to be enlarged to accommodate increasing business.

The New York, Pennsylvania and Ohio shops at Meadville are building for the road three Mogul freight engines, with 18 by 24 inch cylinders.

The Bethlehem Iron Co.'s furnace at Bingen blew in on Monday, the 25th inst.

It is thought that the improvements being made at the large furnaces of the Reading Iron Works, at Reading, will not be completed until late in the spring, when it is expected both will go into blast.

The rolling mill and nail factory of McLaughlin, Smith & Co., at Hollidaysburg, which have been idle for some weeks, started up on full time last week.

The rolling mill, nail factory and sheet mill of the E. & G. Brooke Iron Co., at Birdsboro', which has been idle for some time, resumed operations on Monday, the 25th inst.

PITTSBURGH AND VICINITY.

It is reported that H. C. Frick and a number of Pittsburgh iron men will shortly erect a rolling mill at Mount Pleasant. The

mill, it is said, will be built on the Daniel Rumbaugh Farm. The land referred to is owned by the H. C. Frick Coke Co., and is very desirable location, easily accessible by sidings from both the Baltimore and Ohio and Pennsylvania railroads.

The Pittsburgh Bridge Co. have booked orders to employ the works until April 1; one is for an iron swinging bridge for Chicago.

H. P. Tobey, of Boston, Mass., was in Pittsburgh recently, negotiating with J. P. Whiterow for the purchase and erection of a Clapp-Griffiths steel plant at the Tremont Nail Works, West Wareham, Plymouth County, Mass. The works have an annual capacity of 600 tons of nails, and Mr. Tobey's firm contemplate the manufacture of steel nails in future. The arrangements are not yet complete.

One of the three new hammers at W. D. Wood & Co.'s mill, at McKeesport, has been placed in position and the foundation for another has almost been finished.

Work has been resumed at many of the coal works along the Monongahela River in the vicinity of Pittsburgh. The companies have employed towboats breaking the ice about the tipples to enable them to get coal loaded.

Eastern capitalists are negotiating for the purchase of the plant of the Manchester Iron and Steel Co., in Allegheny. Two or three syndicates are represented. One firm are trying to lease a part of the plant, including the old nail mill and the 26-inch train. Another firm wish to lease the plant for a year as a financial experiment, with a possible view to purchase if it is shown that the investment is profitable. The whole plant has been advertised for several weeks.

OHIO.

The shaft of the blast engine of the Benwood Nail Co., at Martin's Ferry, was broken last week, throwing the men out of employment until it can be repaired. The Robinson & Rea Mfg. Co., of Pittsburgh, are making a new shaft.

The co-operative nail factory now being erected at Steubenville will start up about February 10.

Secretary C. C. Kelly, of the Union Window Glass Works, at Bellaire, which have been shut down since December, 1884, because of low prices, presented data at a meeting of the stockholders to the effect that all the factories selling glass at the present prices are losing money.

Mr. Stewart H. Chisholm, who has been connected with the Cleveland Rolling Mill Co. for 16 years, and since the death of Henry Chisholm, his father, has been its vice-president, has resigned from that position to assume the presidency of the HP Nail Co., of Cleveland. Mr. Wilson B. Chisholm will succeed his brother in the Cleveland Rolling Mill Co. Mr. C. B. Beach, who has been president of the nail company since its organization in 1878, retired from that position on the 20th inst. There will be no change of the interests of the parties in the respective companies.

The Bellaire Nail Works resumed operations last Thursday morning, the 21st inst. On account of trouble with their coal diggers the above company are importing their coal from Pittsburgh.

It is said that the Bellaire Glass Works, at Bellaire, will remove from that place to Findlay on account of the facilities offered by natural gas, which has been struck at the latter place.

The Norwalk Machine Works, of Norwalk, are thinking of locating their business somewhere in Alabama. They make a specialty of engines and boilers from 45 to 60 horse-power, and machines generally.

The Cummer Engine Co., of Cleveland, have just been awarded the contract for furnishing one of their 50-ton refrigerating plants for Benitez, Sobrino & Co., of Puentes Grandes, Habana, Cuba. They have also just received orders for a 100-horse-power engine, with boilers, &c., complete, for Messrs. Stinnett, Rucker & Co., of Sherman, Tex., and for a 170-horse-power engine for G. W. Straight, of Chicago, Ill. Among their recent shipments are a 415-horse-power engine to the Manchester Print Works, of Manchester, N. H.; a 160-horse-power condensing engine to Cowden Bros. & Hoppe, of Hanna, Ind.; an 80-horse-power engine to the Somersworth Machine Co., Dover, N. H., and one of 90-horse-power to Frank Baer, of Greensburg, Pa.

MISSOURI.

The St. Louis Sash Weight Co. have received an order for two carloads to go to Los Angeles, Cal. They have a contract for making 20,000 bridge washers for a railroad company of St. Louis.

The Silver Metal Mfg. Co., of St. Louis, have increased their capital from \$50,000 to \$100,000.

The St. Charles Car Co., of St. Louis, have taken an order from the Cairo Short Line railway for 30 freight cars, to supplement 50 of the same kind of cars previously ordered of them. They are doing considerable repair work for the Missouri Pacific, which, with a number of small orders, keeps them busy.

The Granite Iron Rolling Mills of the St. Louis Stamping Co. turned out about 4500 tons of iron and steel sheets and plates last year.

The Western Cable, Motor and Construction Co., East St. Louis, have been incorporated under the laws of Illinois, with a capital of \$500,000. The incorporators are R. D. Hunter, Edgar L. Marston, William Hacker, Henry Pennington, Joseph R. Carpenter and Laccor P. Boger. The company are licensed to construct street and bridge railways, cable motors and tubings, and machinery for the manufacture of the same.

ILLINOIS.

Work on the 80 feet lattice girders and wrought-iron cylinder pier for the Chicago and St. Louis Railroad is progressing at the

works of the Chicago Forge and Bolt Co. This company have just completed and shipped 20 Howe truss spans and the ironwork for two turn-tables for W. J. Coolidge, city. Their works are running day and night on large orders for car axles. The foundations for the new rolling mill and steam hammers are being laid, and plans for a new forge building, 125 x 420 feet in size, and a new rolling mill and bolt works, 50 x 420 feet in size, are made, and if the weather permits they will be erected this winter, so as to be ready for occupation by spring. Other work in hand includes two engine turntables for the Chicago and Alton Railway, and a large amount of truss and roof work for buildings in this city.—Chicago Industrial World.

The Excelsior Iron Works, Chicago, have enough orders on hand for plate iron and girder roof work to keep them busy for the next 60 days.

The output of finished nails at the Calumet Mills, at Cummings, week before last was 1500 kegs. The state of the strike is unchanged.

The casting department of the Union Foundry and Pullman Car Wheel Works was started up on the 15th inst. These works are now employing about 350 men.

The Calumet Iron and Steel Co., Cummings, are pushing work on repairs with all possible haste, and hope to get their bar mill and all the balance of their works in operation by February 1st. On Saturday last they were working 36 machines in the nail department, and anticipate starting several more this week.

Mr. C. D. Otis, formerly with Hibbard, Spencer, Bartlett Co., and Mr. W. C. Brown have formed a partnership for the sale of hardware, as manufacturers' agents, with their office and salesroom at 154 Lake street, Chicago.

The Secretary of State of Illinois issued licenses of incorporation to the following companies last week: The Charles Morris Co., at Chicago; capital stock, \$50,000; to manufacture fireworks, toys, &c.; incorporators, Charles Morris, Henry Freeman and George R. Walker. The Iron Age Implement Co., at Chicago; capital stock, \$20,000; incorporators, D. J. Waddell, William J. Whispell and Herman Valmer. The Taylor Steele Fire Car Wheel Co., at Chicago; capital stock, \$500,000; incorporators, Edward L. Harpman, Robert H. Pugh and Henry Hannibal, Jr.

The Union Steel Works, Chicago, will start up about June 1. Great improvements are going on at the steel works, which succeeded the old company, and 400 men are at work there. A new Bessemer steel mill is building and new machinery will be put in. It is understood that the mills will employ at least 1000 men.

MICHIGAN.

The Colliau Furnace Co., of Detroit, recently received an order from the Reading (Pa.) Foundry Co. for two of their large-size furnaces complete. The foundry in question is understood to be the largest single-pipe foundry in the country, measuring 255 x 72 feet, exclusive of stock building, core-rooms, &c. We may add that the business of the Colliau Furnace Co. is now managed by Messrs. Bryan & Co., of Detroit.

WISCONSIN.

Amended articles of association have been filed with the Secretary of State by the Superior Iron Co., of Ashland. The name remains the same; the capital stock is established at \$500,000. The object is stated to be to conduct an iron-mining business, and the offices are to be located in Milwaukee.

The Racine Implement Co., with a capital stock of \$10,000, have filed articles of association with the Secretary of State. The object is to manufacture agricultural implements.

MISSISSIPPI.

The Progress Mfg. Co. have been organized at Meridian to succeed the Progress Machine Works of G. W. Soule. The capital will be either \$100,000 or \$150,000. A new foundry and machine and wood shops will be built to employ from 100 to 150 hands. The location has not been decided upon, but will probably be at Meridian.

MARYLAND.

Mr. Mervin McKaig, of Cumberland, writes us that with his improved machinery for making shafting he is enabled to turn out large quantities at very low prices. Orders are coming in so fast that arrangements are being made to run the shafting department day and night.

TENNESSEE.

The Standard Charcoal Co.'s furnace, at Goodrich, has just blown in.

The furnaces of the La Grande Iron Co., at Danville, have gone out of blast and will not blow in again till April next.

VIRGINIA.

The Virginia Nail Works, of Richmond, are unable to keep up with their orders and are now doubling their capacity. For some months they have been behind their orders.

The Roanoke Machine Works have closed a contract with the New York, New Haven and Hartford Railroad Co. for the construction at once of 500 freight cars for that railroad. The Norfolk and Western Railroad Co. have also given an order to the works for two new engines, to be followed by an order for 17 more. The works are also expecting an order in the early spring for 500 more freight cars. This indicates that these immense works will be kept busy with full force for an indefinite time.

WEST VIRGINIA.

Mr. O. C. Dewey, formerly of Dewey, Vance & Co., Wheeling, has made an offer to build and equip a nail factory of 60 machines and hand it over to any company for \$50,000. It is said a number of Wheeling nailers are making an effort to raise the money.

The sum of \$10,000 has been subscribed by Wheeling citizens toward the erection of a co-operative nail factory in that city.

The Ensign Mfg. Co., of Huntington, have the following new orders: Ninety box cars for the C. O. and S. W.; 500 box cars and 20 gondolas for the A. and B. S. L.; 12 flat cars for the C. and N.; 26 patent stock cars and one caboose, making in all, 669 cars to make within the next four months.

GEORGIA.

The new machine shops, now in course of erection at Athens will be completed in about a month. Fifty men will be employed at the start.

ALABAMA.

The Woodstock Iron Co., Anniston, claimed exemption from taxation for 10 years under the act of the Legislature of 1873. The law was repealed in 1876, and the Calhoun County authorities claimed taxes for the State and county from the date of repeal until 1883, when the limit of exemption expired. In the suit for the taxes the county won before the county commissioners. The company held that they were exempt for the period of the law, as their works were erected between the time of enactment and repeal of the law, and an appeal has been taken to the Supreme Court. Fully \$5000 is involved. In anticipation of arrangements to make steel, the firm have changed their name to the Woodstock Iron and Steel Co.

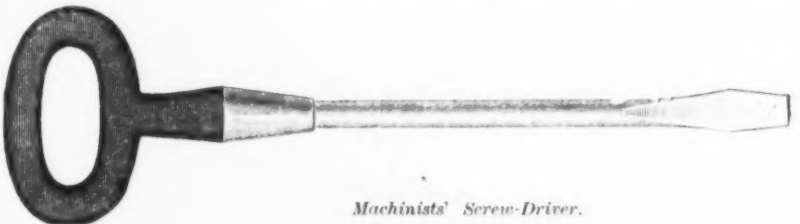
An experimental cargo of Alabama coal has been shipped from Mobile to Havana, Cuba.

Woodstock Furnace No. 1, at Anniston, is just starting again, having been repaired.

Hardware Novelties.

Machinists' Screw-Driver.

The accompanying illustration represents the Standard Screw-Driver, which is manufactured by the Standard Tool Co., Cleveland, Ohio. The handle is described as made



Machinists' Screw-Driver.

of iron, and the blade of the best English tool steel. The screw-driver is designated as No. 115, and is made with blade from 4 to 12 inches in length. It is packed half-dozen in a box. The same company have also recently put on the market their Stubbs' steel screw-driver bits, to the quality of which they call attention.

The Watts Door Check and Spring.

The Watts Mfg. Co., 480 Pearl street, New York, are manufacturing the article above named, and which is illustrated by the accompanying cut, which represents it applied to the door. It consists, it will be observed, of a cylinder open at one end combined with a piston and rod, the one stationary and the other applied to the door, so that when opening the door the piston is drawn entirely from the cylinder and is held in position by a peculiarly constructed spring joint attached to the piston-rod in such a way that it enters the cylinder when the door approaches its closed position. The compression of the air in the cylinder prevents the door from slamming, as it cannot close until the air in the cylinder has had time to escape through an aperture for this purpose, the size of which is regulated by turning the cap, a feature to which the manufacturers call attention as permitting a very simple adjustment. Attention is also called to the fact that the same check can be placed either upon the door or on the

checks and springs is done away with, so that the door opens easily and without the exercise of much force. Another point to which the manufacturers allude is the simplicity of the construction, and the fact that any ordinary person, though unskilled in applying the check, can readily adjust it to the door and casing so that it will operate perfectly. The checks and springs are manufactured with brass cylinders, the fittings being of iron, brass-plated, and the whole highly polished and lacquered. They are also furnished in nickel-plate on special orders. They are warranted not to get out of order, and the manufacturers refer to some principal buildings in this city where they are being used with satisfaction. The door check is made in three sizes—small, medium and large.

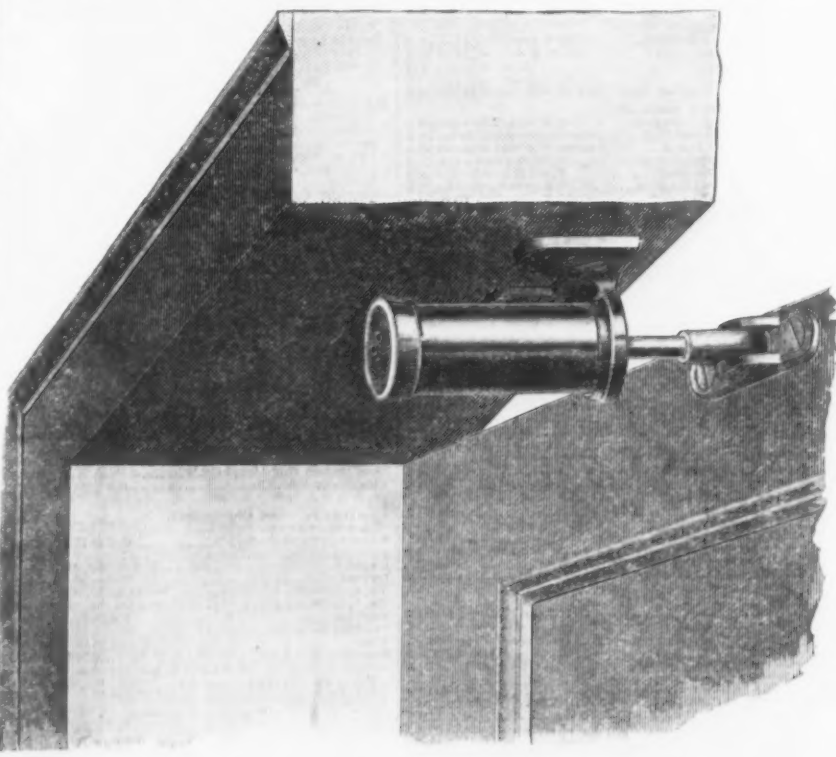
Manufacturing Profits in England.

Mr. Bright, in his great speech at Rochdale, in November last, took up at some length the business depression in England. Mr. Bright ascribes this to the overdoing of business in certain branches where there have been within a few years enormous profits made. His remarks on this point were as follows:

If you were to go back for the last 10 years you would probably find that the number of ships—larger ships than ever before—that has been built is so great as to astonish all men understanding the matter as to how those ships were by any possibility to find cargoes. Things were very prosperous. I know a gentleman who told me that his firm, shipowners, made a profit of £10,000 on a single cargo of a single ship laden with wheat, coming from San Francisco to this country. Take the trade in iron. I know a gentleman who has large iron works and collieries, and I recollect in the year 1873, 12 years ago, he told me that in the last year the dividends upon those works were 120 per cent; that is, that for every £100 of capital that he had in his business during that one year he had cleared

£120; and he said, "Things are getting very bad indeed for this year"—and he smiled pleasantly as he said it—"the dividend has fallen to 90 per cent." The men who were making so large incomes at that time reinvested their money in increasing their business. Many of the concerns in this trade doubled their establishments, new companies were formed, and so the produce of their manufacture was extended to such a degree that the prices went down and the profit vanished. Take our own neighborhood. I cannot tell you what is the increased number of spindles in the cotton trade, or of looms in the east of Lancashire, but it is very large within the last few years. Under the limited liability act you have seen as it were a great town only six miles from here grow up and double itself. And all this has been done with the haste and with the rashness which followed the considerable profits and large dividends which these mills made.

Investigations show that the limit of temperature at which men can work depends upon the length of their exposure, the amount of exertion they put forth, their condition, and the nature of the atmosphere, particularly as to its degree of moisture. It is stated that men have been employed on railways at 104°, in mines, under very favorable conditions, at 125°, and are said to work occasionally in the stove-holes of tropical steamers at 156°. Professor Du-



The Watts Door Check and Spring.

casing of the door, the inside or outside, thus obviating the necessity for right or left hand checks, as the one check will answer for any position. This is accomplished by having the spring separate from the check, so that it will work equally well for a right or left hand door. Another important advantage which is mentioned as resulting from having the spring and check separate is that the friction necessary in combined

bois is reported to have estimated that a temperature of 122° can be endured when the air is as dry as possible, but that even 104° is likely to be fatal in an atmosphere saturated with moisture. It is also considered certain that men cannot become accustomed to stand for any considerable time a higher temperature than from 145° to 165°, even when they keep perfectly still and are in quite pure air.

[illegible]

WHOLESALE METAL PRICES, January 27, 1886.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no Bar shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scrolled, 1¢ to 1-4-10¢ per lb. Railroad Bars weighing more than 25 lb per yard, 7-10¢ of 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1	ton	18.00	17.50
Foundry No. 2	ton	17.00	16.50
Gray Forge	ton	16.00	15.50

No. 1 Scotch Pig Iron.

Carnbroe	ton	20.50	21.00
Coltess	ton	20.00	20.50
Shotts	ton	20.00	20.50
Glenarnock	ton	19.50	20.00
Gartbarrie	ton	20.00	20.50
Langloan	ton	20.50	21.00
Summerlee	ton	19.00	19.50
Dalmellington	ton	18.00	18.50
Eglinton	ton	18.50	19.00
Clyde	ton	18.50	19.00

Halls.

Steel, at Eastern mills	ton	23.00
Old Halls, T.S.	ton	22.00

Scrap.

Wrought, per ton, from yard	22.50
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Bar Iron from Store.

Common Iron	ton	1.75	1.80
Refined Iron	ton	1.90	2.00
1 to 6 in. round and square	ton	1.90	2.00
1 to 6 in. x 3/4 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/2 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/4 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/8 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/16 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/32 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/64 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/128 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/256 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/512 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/1024 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/2048 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/4096 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/8192 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/16384 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/32768 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/65536 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/131072 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/262144 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/524288 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/1048576 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/2097152 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/4194304 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/8388608 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/16777216 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/33554432 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/67108864 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/134217728 to 1 in.	ton	1.90	2.00
1 to 6 in. x 1/268435456 to 1 in.	ton	1.90	2.00
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MECHANICAL.

The Beaudry Upright Cushioned Power Hammer.

The accompanying illustration shows the latest improvements in the Beaudry upright hammer, which was put on the market about two years ago, and was illustrated and described in our columns at that time. Briefly repeating, however, we may note that the hammer is made entirely of iron and steel, with bronze or other anti-friction metal on all important bearings. The hammer ram is lifted by means of a duplex helve through the intervention of a special lifting belt. This is an endless raw-hide many-ply belt, which passes double through a slot in the upper section of the hammer ram. Through loops thus formed in each end of the strap the rounded ends of the duplex helve pass and are secured there by a nut and a bronze spool. This arrangement secures a square, positive stroke, for the slot through which the strap passes is sufficiently large to allow for the traveling of the strap as it manipulates the hammer ram. The back ends of the duplex helve pass through a journal resting in pillow-

blocks. Here they are secured and cushioned by rubber on all sides, so that all recoil is taken up and all danger of breakage removed. The steel arms of the duplex helve spring with each stroke, so that the machine is relieved from sudden strains. This, with the elasticity imparted by the lifting belt and rubber springs, renders the blow exactly like that given by the blacksmith's hand hammer—elastic, but not crushing. For this reason no jar is perceptible in the working parts when the blow is struck. The stroke is directed by the foot of the operator from any of the three working sides of the hammer. The keys holding both upper and lower dies are driven in from the front, and the use of a long bar in driving them out from the rear is thus avoided. This is a valuable consideration in adjusting dies where accuracy is required. When the

duplex helve, the patent lift and the admirable system of cushioning are main features, has already secured for it much favor, and its use is likely to be greatly extended. It is adapted for diework, all kinds of forging in general job and railway shops, and for carriage, cutlery, spindle and general and special toolwork. It is built by Messrs. Beaudry & Cunningham, Boston, Mass.

Burning Dust Fuel.

Referring to our recent article on "Dust Fuel for Boilers," in which we spoke of the difficulties in the way of satisfactorily burning anthracite culm, the United States Rocking Grate Bar Co., of Chicago, Ill., direct our attention to their rocking grates, for which, as some of our readers may remember, a number of important advantages are claimed. The device was shown in our columns some two years ago, and we need not, therefore, refer to it here in detail. The essential feature of the grate consists in an arrangement of "clips" so fastened to the grate bar as to allow of different sized orifices being formed in the bed by the action of a hand lever. This action removes the cinder and clinker without the use of hand

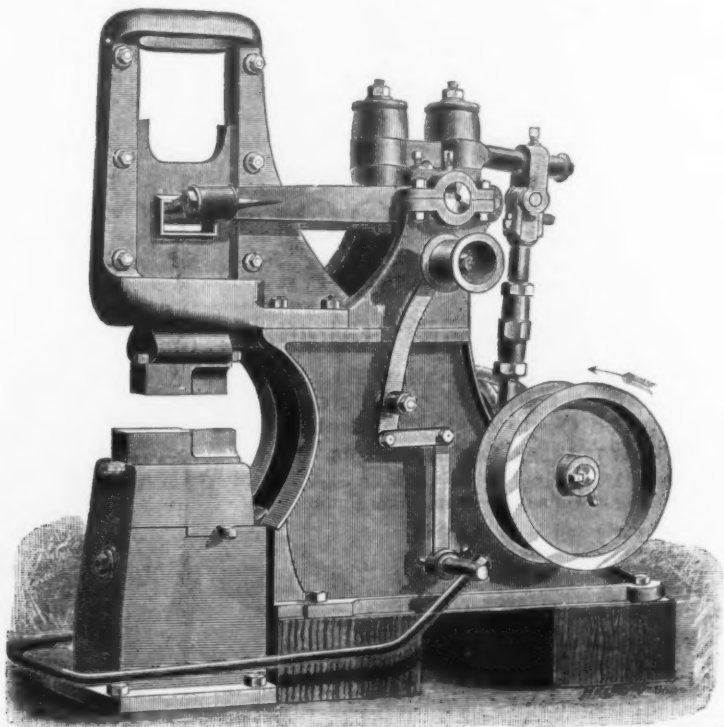
ing arrangements are very perfect. The gearing is cut in the most accurate manner, and is inclosed in oil-tight housing and runs constantly in oil, and the wear is reduced to a minimum. The blower is driven by chain-wheels and chain belting, and the speed is multiplied by cut gears. The blast is discharged on the under side at the end and taken to the tuyere in a pipe with only one elbow. The different parts are all made to standard size, and any part may be duplicated. The blower is constructed entirely of metal, with no lining of plaster-of-paris or other perishable material. Messrs. Cooke & Co., of 22 Cortlandt street, New York, are the selling agents.

Corrugated Furnace Flues.

The practical value of a corrugated surface to the furnaces of marine and land boilers is now so well known and so universally admitted that we need not here point it out. The recognition of this is perhaps best testified by the fact that more than 10,000 corrugated furnaces have been applied to boilers of all forms of construction

thus compressing the confined steam the live steam passes through the port 10 and acts upon the piston G, moving it and the valve F. The port 7 is thus closed and the port 4, for admitting live steam to the cylinder, opened. The exhaust on the other side of the piston C is also opened by 6 to M, and the steam accordingly commences to move the other way. The exhaust of the steam decreases the pressure in the port 10, and the steam in the valve-chest, therefore, acting upon the rod of the valve-piston G, drives the latter back before the main piston C uncovers the port 5, and then the steam coming through 5 and 11 holds G in place. The steam coming through 10 causes the pressures to balance at opposite sides of the piston G, and hence the latter remains in its normal position. The whole action is, of course, repeated at the other end of the stroke. It may be argued with good reason that, if from any obstruction the valve should be moved just sufficiently to exactly cover both steam ports 4 and 7, the pump might come to a stand still. To prevent this, however, the ports 12 and 15 (Fig. 3)

where the valve lifts bodily and is parallel to the seat the water does not escape freely to the side where the greatest quantity passes to the port, and the supply is somewhat throttled. Where the valve is hinged at



The Beaudry Hammer, Built by Beaudry & Cunningham, Boston, Mass.

blocks. Here they are secured and cushioned by rubber on all sides, so that all recoil is taken up and all danger of breakage removed.

The steel arms of the duplex helve spring with each stroke, so that the machine is relieved from sudden strains. This, with the elasticity imparted by the lifting belt and rubber springs, renders the blow exactly like that given by the blacksmith's hand hammer—elastic, but not crushing. For this reason no jar is perceptible in the working parts when the blow is struck. The stroke is directed by the foot of the operator from any of the three working sides of the hammer. The keys holding both upper and lower dies are driven in from the front, and the use of a long bar in driving them out from the rear is thus avoided. This is a valuable consideration in adjusting dies where accuracy is required. When the

rakes. We understand that nearly 900 sets of these grates are now in use giving every satisfaction. It is claimed that in many places they are used with the poorest slack with good results.

Roots' New Acme Hand Blower.

The Roots New Acme Hand Blower, made by Messrs. P. H. & F. M. Roots, of Connersville, Ind., and shown in the annexed cuts, commends itself to the attention of blacksmiths and metal-workers. It has been freed from all complications and reduced to the lowest elements of simplicity. While its size, it is claimed, has been reduced to a compass of less than a man's hat, it will produce a blast of greater strength and volume than the largest size of the unwieldy bellows. The revolvers are inclosed in an iron case, which is bored out perfectly true,



Fig. 1.—Elevation.

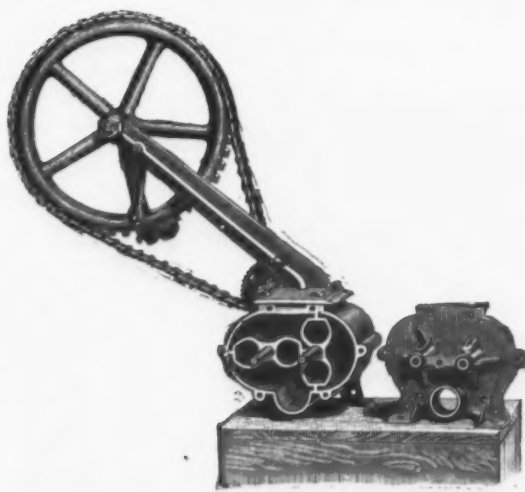


Fig. 2.—Longitudinal Section.

THE ROOTS' NEW ACME HAND BLOWER, MADE BY MESSRS. P. H. & F. M. ROOTS, CONNERSVILLE, IND.

hammer is not in use the dies always stand apart, ready for use, and the distance between them can be varied from actual contact to 6 inches or more in the smaller sizes, and 15 inches or more in the larger sizes. These variations can be made by means of the adjustable regulator, making the hammer especially valuable in jobbing shops, where material differing greatly in size has to be worked. The simple and practical design of the hammer, of which the

and is only about 12 x 9 x 8 inches in size. The revolvers, which are of iron, are constructed on an entirely new principle, and are dressed, so that they will keep up perfect and continuous contact with each other and the case during the entire revolution, thus forcing forward and utilizing all the air taken into the case. The shafting is steel of the best quality. The bearings are of phosphor-bronze, arranged so that they can be easily renewed in a short time. The oil-

the steam is passing through the port 7 and the piston is moving to the right, and the exhaust 5 is open by the valve to M. As soon as the piston C passes or covers the ports 5 and 13 the steam in the cylinder is confined, and prevents the piston C striking the cylinder-head. The distance between the port 10 and the cylinder-head is greater than the thickness of the piston-rod, and the steam, therefore, enters the port 10 as soon as the piston uncovers it; while the piston is

are provided, passing down into the steam cylinder, and holes are drilled through the valve so that when the latter is in the position mentioned these holes correspond with the ports 12 and 15, as shown in the top view of the valve and seat, and let steam pass into the cylinder. The steam will then act through the ports 8 or 10 upon whichever valve-moving piston is to be moved furthest to complete the movement of the valve. The openings in the valve F naturally correspond with the ports 12 and 15 only at the middle of the valve travel, and the ports are closed at all other times. It may be added that when the valve F is on its center, and the ports 12 and 15 are open into the steam cylinder, if the steam piston C is covering one of the ports 10 or 8, and thereby obstructing the operation of the valve motion, the steam admitted by 12 and 15 will act upon the steam piston, moving it until the port 10 or 8 that had been covered is uncovered, and the steam acting through this port upon the valve-moving piston will remove the valve from its central position. It will readily be seen that there is therefore absolutely no dead point in the travel of the valve F, and the pump will start from any point as soon as steam is admitted. Water of condensation is removed from the cylinder in the following manner:

Beneath the cylinder is a small valve-chamber, T, which is tubular, and provided with caps at the ends and valves with triangular guide-stems in the smaller inner portion of the tubular chamber T. The combined length of the two valve-stems is greater than the distance between the seats for the valves, and there are ports 13 and 14 from the ends of the chamber T to the steam cylinder, and a lateral discharge-pipe between the valve-seats, which may be provided with a cock. When steam acts on one side of the piston C, the pressure closes the valve upon which it acts, opening at the same time the other valve, so that water of condensation can run off at the exhaust side from the cylinder. These operations are automatic, the valves closing and opening in opposite directions at each admission of steam to the cylinder. A chamber, V, is moreover provided, and also a circumferential channel around the steam cylinder to connect the exhaust port M with the lateral discharge-pipe already mentioned, so that any water of condensation in the rising exhaust-steam pipe may be at liberty to run down at once into the chamber V, and pass away with the water of condensation from the steam cylinder. Two small blocks of wood or other similar material, one of them being marked P in the cut, are arranged in the valve F to act as buffers for the rods of the independent pistons G and G'.

It will be noticed that neither pump nor steam cylinder has any stuffing-box for the rod D, its place in each case being supplied by a long sleeve, strengthened by ribs A A', and furnished with a brass bushing, as shown. Turning to the water cylinder B of the pump, the reader will find several novel features. Mr. Carricaburu, as will be seen, employs spring-valves of peculiar construction, which not only lift from their seats, but also swing to an angle, thus allowing an unobstructed passage of the water. These valves do not require any hinge, and the seat is easily kept clean and free from foreign substances. The heads of the valve-chest are removable at either side to give access to the valves. These are seen from different points of view in Figs. 1 and 2, and require no special explanation. The water to be pumped first enters the chamber h, thence passes through one of the lower set of valves, according to the direction of travel of the piston, and finally through one of the upper set. Referring again to the valves, it may be added that

one side it does not lift free from the seat, and any solid substance in the water is liable to be thrown upon the seat near the hinge, because there is not sufficient rush of water to prevent the same lodging. Mr. Carricaburu's arrangement avoids all this in a very

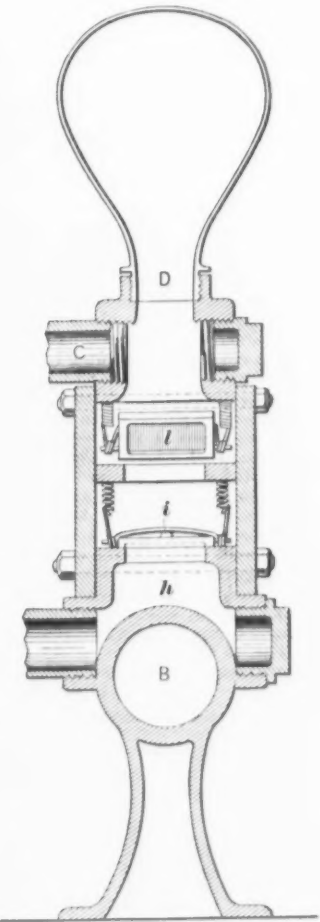


Fig. 2.—Cross-Section of Water Cylinder, Showing Valves.

simple way, and a free discharge all around the valve is secured. Mr. Carricaburu has also designed several duplex pumps, all embodying interesting and valuable features.

We recently had occasion to examine one of the pumps which we have described, and from all that we could find, very satisfactory

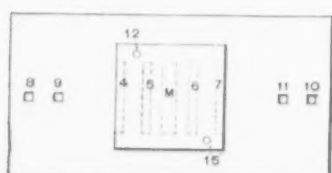


Fig. 3.—Top View of Valve and Seat.

work was being performed. The requirements of simplicity, durability and compactness have evidently been thoroughly satisfied, and, while we cannot speak as to its efficiency, there certainly seems to be reason to expect a creditable performance. Mr. Carricaburu's address is 37 West Forty-seventh street, New York.

The Puddling Capacity of Great Britain.

The Iron and Coal Trades Review has issued an almanac for 1886 in which is published a list of the firms in the United Kingdom manufacturing finished iron, the name of the works owned by each firm and the number of puddling furnaces at work and idle. It is a long time since such a return has been drawn up in detail, and great changes have taken place during the last 10 years. It has been repeatedly asserted—and, indeed, the statistics bear this out—that the finished-iron industry is waning, owing to the steady advance of steel. It is only within the last five years that statistics of production have been collected, and these show that in 1881 the output was 2,681,150 tons; in 1882, 2,841,534 tons; in 1883, 2,730,504 tons, and in 1884, 2,237,535 tons; so that the trade yet remains a most important one; and if, as is predicted by competent authorities, the days of puddling are numbered, it seems as if the number of days would still be large, for it is only in two or three branches that steel has superseded iron. A list of the puddling furnaces should, therefore, be quite as useful as one of blast furnaces. The summary of the list from the almanac is as follows:

England and Wales.			
Name and situation of works.	At work.	Idle.	
Cheshire.....	22	0	
Cumberland.....	11	27	
Derbyshire.....	30	30	
Durham.....	47	41	
Glanorganshire.....	497	387	
Lancashire.....	195	100	
Leicestershire.....	321	61	
Monmouthshire.....	70	71	
Nottinghamshire.....	14	4	
Shropshire.....	154	4	
Somersetshire.....	18	0	
Staffordshire, North.....	353	75	
Staffordshire, South.....	285	288	
Worcestershire.....	156	32	
Yorkshire, Cleveland.....	300	192	
Yorkshire, West Riding.....	382	162	
Scotland.			
Lanarkshire.....	294	117	
Totals in Great Britain.....	4,069	1,581	

Twenty years ago 6407 furnaces were at work; in 1872—the briskest period the malleable-iron trade has ever known—there were 7311, and in 1875 7575, the largest number reported. Since that year the number working has rapidly fallen off, and this year only 4059 are returned as working and 1581 as idle. The number of establishments engaged in the manufacture of puddled iron was 332 in 1878, against only about 250 at present.

The Committee on Uniform Standard Time of the American Society of Civil Engineers have made an interesting report in respect to the progress of the 24-o'clock system and uniform standard time. They reported that 171 railroads, operating 60,000 miles, were ready to join the movement to abandon all use of "a. m." and "p. m." and some urged no delay. The Canadian Pacific had determined to take the initiative, and a telegram received during the meeting announced that it had already gone into operation. Time-tables were printed, all watches and clocks on the road were being changed, and the Northern Pacific and other Northwestern roads had the same steps under consideration.

Messrs. Bolckow, Vaughan & Co. have decided to make certain alterations and extensions in their steel-making plant. Inasmuch as they have hitherto had only two Siemens furnaces, the produce of which in ingots could not exceed 300 tons per week, it was quite clear that they would be driven to put up more. Their plate and angle rolling machinery is equal to at least 1000 tons per week, and requires about 1400 tons of ingots to keep them in full operation. The recent decision of Lloyd's Committee, excluding for the present all basic steel from being used in shipbuilding, has no doubt compelled the step in question as the only alternative against allowing this part of their plant to remain idle. There is now considerable danger of steel-making by the Siemens process being overdone, even in the North of England, where hitherto manufacturers have been rather behindhand. Thus, in addition to the new plant about to be put down by Messrs. Bolckow, Vaughan & Co., and the extensive plant of the Consett Iron

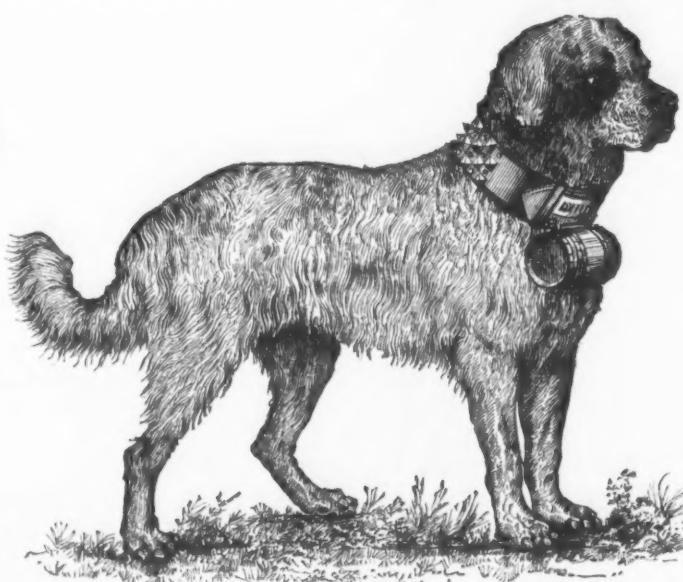
Co., there are the steel works just completed by Palmer's Shipbuilding and Iron Co., at Jarrow, and also a somewhat smaller works in operation at Spennymoor. Besides these there are not less than three steel-melting plants for the purpose of making castings, viz., that of Spencer & Sons, at Newburn, near Newcastle; that of the Wolsingham Steel Co., and that of Messrs. Butler Brothers, at Middlesboro'. There is scarcely sufficient work in ship and boiler building to employ fully all these places, but they are being put down, no doubt, more with regard to future than to present needs.

CONTENTS.

	PAGE
Foreign Ironmasters in Russia.....	1
Ericsson's Submarine Torpedo Gun. Illustrated.....	1
The Sums Directly Involved in the Passenger War.....	5
Cleaning New Rubber Corks and Tubing.....	5
English Shipbuilding in 1885.....	7
English Letter.....	9
Latest Legal Decisions.....	11
The Production of Pig Iron in the United States in 1885.....	13
Bills Before the Ways and Means Committee.....	15
The Demand for Car Lumber.....	15
The Rise and Fall of Prices.....	15
Heavy Locomotives and Bridges.....	15
Editorial:	
The Production of Pig Iron in 1885.....	16
The Tax on Commercial Travelers.....	16
Manufacturers and the Tariff.....	16
Immigration in 1884 and 1885.....	16
Value of a Guarantee.....	17
The Report of the Fortification Board.....	17
Washington News.....	17
The Outlook for Tin.....	17
The Iron Age Directory.....	19
Trade Report:	
British Iron and Metal Markets.....	21
Financial.....	21
Metal Market.....	21
Coal Market.....	21
New York Iron Market.....	22
Metal Exchange.....	22
Philadelphia.....	22
Pittsburgh.....	22
Chicago.....	23
Chattanooga.....	23
Birmingham.....	23
Cincinnati.....	23
Louisville.....	23
Detroit.....	23
St. Louis.....	23
General Hardware.....	24
Imports.....	25
Exports.....	25
Industrial Items.....	27
Hardware Novelties:	
Machinists' Screw-Drivers. Illustrated.....	27
The Watts Door Check and Spring. Illustrated.....	27
Manufacturing Profits in England.....	27
Current Hardware Prices.....	28
Wholesale Metal Prices.....	30
Mechanical:	
The Beaudry Upright Cushioned Power Hammer. Illustrated.....	31
Burning Dust Fuel.....	31
Root's New Acme Hand Blower. Illustrated.....	31
Corrugated Furnace Flues.....	31
The Carraburu Steam Pump. Illustrated.....	31
New Machinery for Hardware Manufacturers. Illustrated.....	33
Liquid Fuel.....	33
The Mason Pressure Regulator. Illustrated.....	33
Pressure on Bearing Surfaces.....	33
The Puddling Capacity of Great Britain.....	32
The Responsibility for Shrinkage in Car Coal Shipments.....	33
Trade Publications:	
Well-Drilling and Prospecting Machinery.....	35
Boilers and Steam Engines.....	35
Blowers.....	35
Rotary Engines with Movable Partition. Illustrated.....	35
Continental Statisticians on the Decline of British Trade.....	35
The Week.....	37
Foreign Markets.....	39
Scientific and Technical:	
The Effect of the Genesis of Coal Upon its Properties.....	39
Eskimo Building-Snow.....	39
Making Sea Water Potable.....	39
An Imitation of a Hard-Coal Fire in Burning Natural Gas.....	39
Philadelphia and Pittsburgh Hardware and Metal Prices.....	43
Boston Hardware and Metal Prices.....	44

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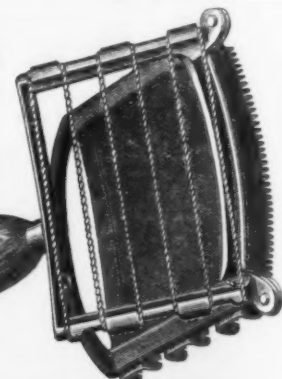
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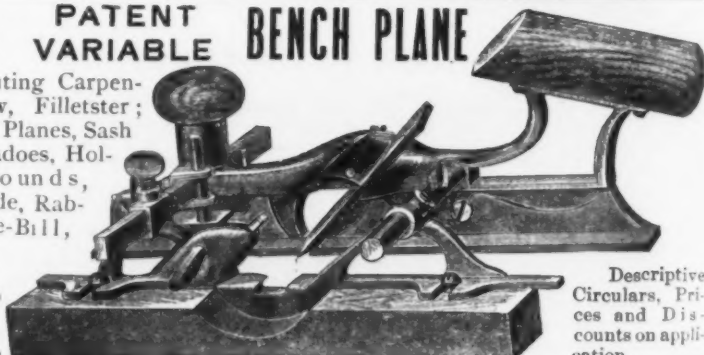
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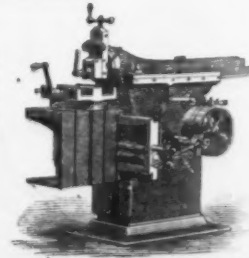
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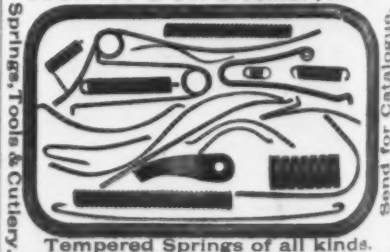
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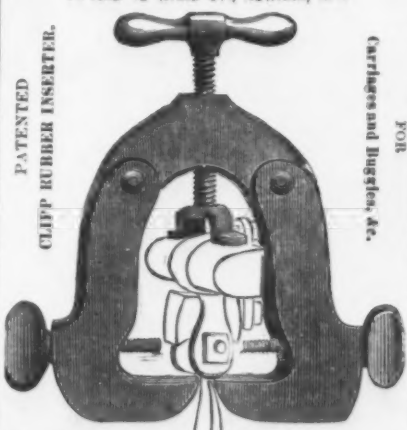


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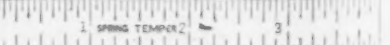
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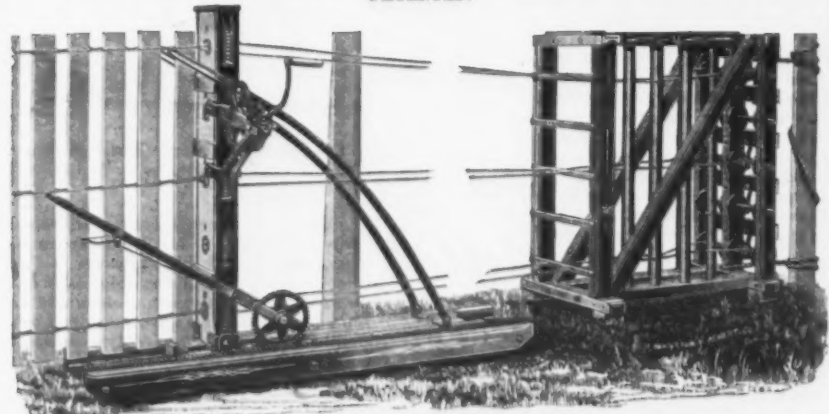
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New Machinery for Hardware Manufacturers.

Messrs. John Adt & Son, of New Haven, Conn., are now putting on the market a number of improved machines specially designed for the manufacture of hardware. Of these we show several in the accompanying engravings.

Fig. 1 represents a gang of four machines for drilling door butts and other hardware. At the top and front is a sliding carriage or chuck for holding the work; at the bottom is a drill spindle, with a protection to prevent chips getting into its bearings. The carriage is operated by a steel feeding-screw in the rear, running through a split nut which is connected with the small lever.

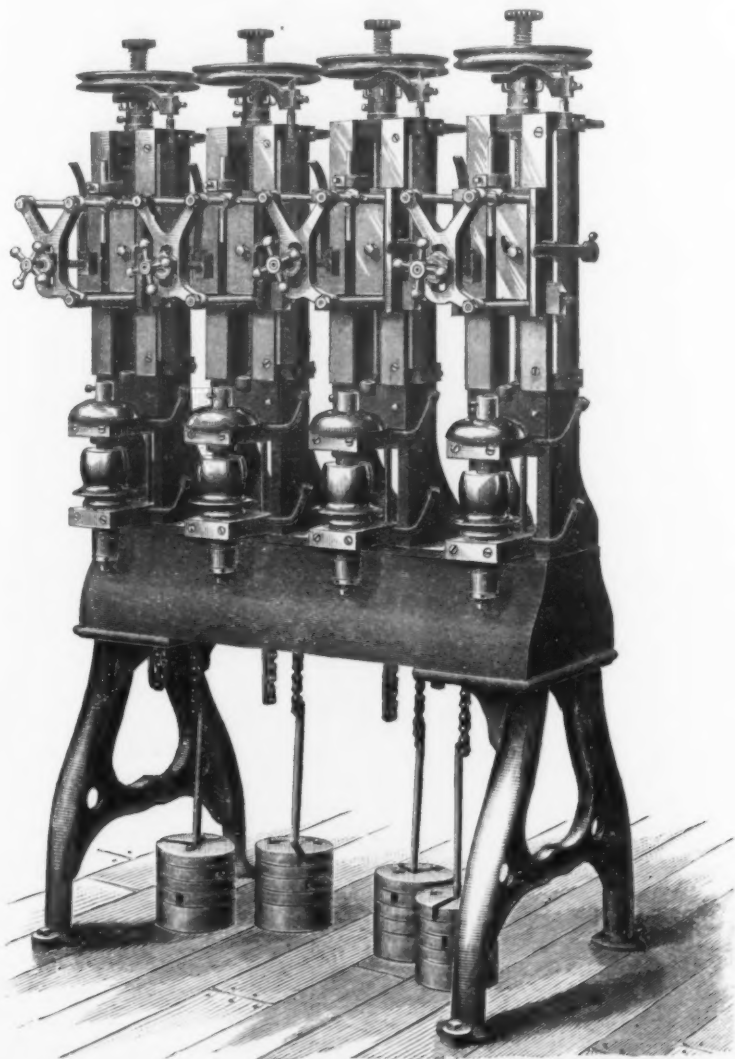


Fig. 1.—Semi-Automatic Butt and Hardware Drilling Machine.

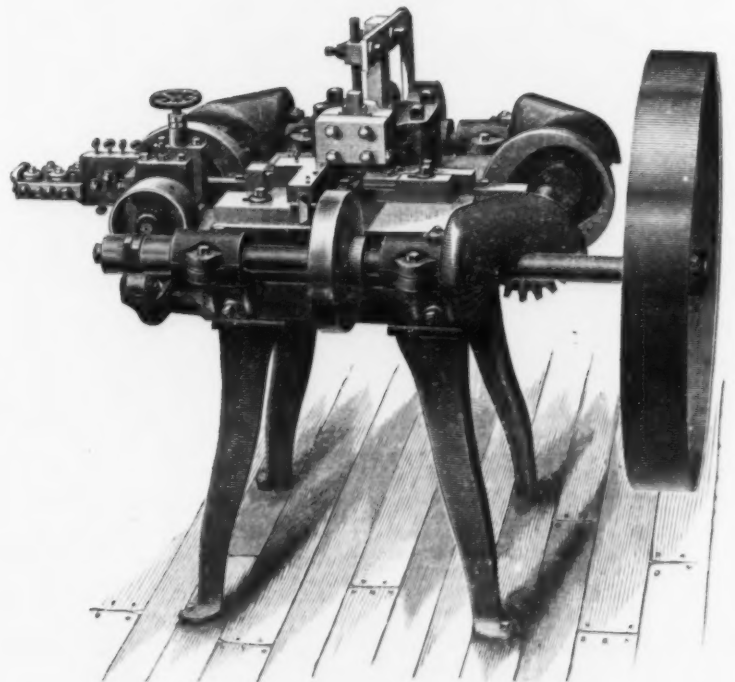


Fig. 3.—Automatic Wire-Forming Machine.

NEW MACHINERY FOR HARDWARE MANUFACTURERS, BUILT BY MESSRS. JOHN ADT & SON, NEW HAVEN, CONN.

The operator, after placing the article to be drilled in the chuck, starts the machine by closing the nut with a slight motion of the lever. The carriage then moves toward the drill and continues until it has reached the proper depth, which is regulated by a sliding gauge on the side of the machine, when the nut instantly opens and allows the carriage to slide back to its former position. It is so arranged that should the drill become dull before reaching the proper depth the feed will stop, and the carriage slide back immediately. Both the spindle and feed-screw are run by belts from horizontal counter-shafts in the rear. One boy can operate 10 machines. The engraving represents the smallest number which it is recommended to mount.

A wire-forming machine is shown in Fig. 2. This machine is intended for making articles that require both vertical and horizontal motions, including diamond and lance-pointed and barbed staples. The arrangement of tools is such that the changes necessary for a variety of work can be easily made by a good machinist. It is entirely

automatic in operation, taking wire from the coil and turning out the completed articles very rapidly.

The automatic wire-forming machine shown in Fig. 3 is designed for cutting and forming wire into various shapes, including screw-eye blanks, buckle frames and bows, suspender, D, oval and round rings, belt hooks and an almost endless variety of other articles. They are furnished with various motions, as may be required for bending or stamping the wire into the desired shape. Articles that are very difficult to be made, and are sometimes handled several times over on other machines, can be made on this style of machine at one operation. It takes the wire directly from the coil and produces

Liquid Fuel.
Referring to some of the existing practical difficulties in the way of successfully using petroleum for steam raising, the London Engineer says:

Petroleum in all its varied forms is too well known to render it necessary that we should say much about it here. An average sample contains—carbon, 85 per cent.; hydrogen, 13 per cent., and oxygen, 2 per cent. Its calorific value is very high, because of the large quantity of hydrogen. Petroleum oils are of almost endless composition, and are obtained by distillation from petroleum or crude rock oil, as it is sometimes called. Petroleum will evaporate theoretically about 18 pounds of water per pound of oil. Petroleum oil is of higher value, as it will evaporate as much as 25 pounds of water per pound. Its calorific value may be taken as $2\frac{1}{2}$ times that of coal, while the value of the crude oil is a little less than twice that of coal. In practice, however, no such results have ever been obtained; and because attention is being once more directed to the subject, and hopes may be formed which cannot be realized, it is well that we should say something of the practical difficulties which stand in the way.

In order to give liquid fuel every advantage, we shall take the value of coal in the following comparison at $9\frac{1}{4}$ a ton—that is 0.05d. per pound. The lowest price at

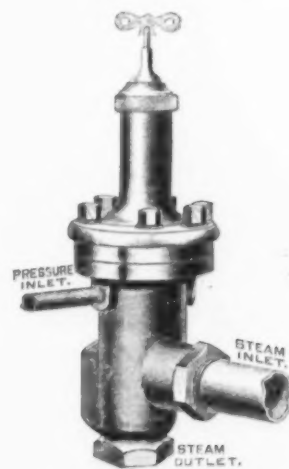
smoke itself does not necessarily represent much loss of fuel, but the deposited soot does, because its coats the heating surfaces with an admirable non-conductor; and there is a strong tendency to the production of what is known as greasy soot, which clings and sticks, and can only be got rid of with much trouble. To prevent smoke the oil must be burned with a large supply of air in a brick-lined chamber, which will prevent the rapid cooling of the gas and partial extinction of the flame. This entails a very important modification in the structure of a boiler for reasons which will be apparent hereafter. The only possible place where liquid fuel may be used with advantage by English engineers is at sea; but any attempt to use it in the existing boilers practically deprives them of the heating surface of the furnaces, because these must be lined with fire-brick if combustion is to be complete. The bulk of the work will be transferred to the combustion chamber and tubes, and this would entail a high chimney temperature and consequent waste if the combustion chamber temperature was raised above what it now is when coal is burned. It appears certain that the total efficiency of a marine boiler burning liquid fuel instead of coal must be lowered. This is a simple deduction from theoretical considerations, but it has hitherto been borne out in practice, for the Himalaya, the steamer which recently made a run to Leith with liquid fuel,

in the boilers, and this entails constant risk of incrustation. Indeed, when the voyages are long and the pressures high it would be impossible to work at all in this way, and steam would have to be furnished by a supplementary boiler working with salt water at a low pressure; or else special distilling apparatus must be provided to furnish fresh water to the main boilers. We have here a second and very serious obstacle to the use of liquid fuel at sea.

The great merit which is claimed for liquid fuel is that, owing to its superior efficiency, either a much smaller quantity of it than of coal may be carried, or that a given weight of it will take a ship much further than would a similar quantity of coal. It is for this reason that it is being tried in the navy. We shall grant, for sake of argument, that liquid fuel may be carried with as much safety as coal. Bulk for bulk, however, it will occupy about as much space. If, however, it can be shown that a ton of liquid fuel will do as much as $1\frac{1}{2}$ tons of coal, then space may be saved or the duration of cruises prolonged. It may also be urged, and with justice, that the number of hands required in the stokehole will be largely reduced. Such points as these are well worth consideration in the navy, and we are glad to see that an experiment is being tried with liquid fuel. In the mercantile marine petroleum has no chance whatever; the price must always prove fatal to its success. In the navy price is a secondary consideration, and as a fuel for war-ships it may yet be adopted. But it must not be forgotten that even a small shell exploded in a mineral-oil tank would produce the most appalling results. The principal point to be decided is, however, the possibility of burning the oil to advantage at sea. This has yet to be proved. Until this is done it may be mere waste of paper to point out objections to the use of a comparatively volatile inflammable fluid as a fuel. The next point to be decided is the possibility of getting it at a sufficiently low price. Experiences on the Caspian are valueless, because liquid fuel can be had there for next to nothing.

The Mason Pressure Regulator.

The accompanying cut illustrates a new pressure regulator for steam pumps, manufactured by the Mason Regulator Co., New York. It is designed to automatically maintain any desired pressure against which a steam pump is working, such as in automatic sprinkler service, water-works systems, &c. The regulator is set in the steam-inlet pipe and the pressure admitted underneath a phosphor-bronze diaphragm through the small



The Mason Pressure Regulator.

pipe marked "pressure inlet," in cut. To this diaphragm is attached a small auxiliary piston, which, with the variation of pressure, opens and shuts a small port, thereby admitting steam on the upper surface of a differential piston. The smaller and lower half of this piston constitutes the steam throttle, controlling the speed of the pump. When the pressure against which the pump is working exceeds the desired limit, the diaphragm is slightly raised (never over $\frac{1}{4}$ inch), the port is opened, and the steam, acting upon the larger surface of the differential piston, closes the throttle. When the pressure falls below the desired limit the reverse action takes place and the pump "speeds up." The regulator is set to the desired pressure by simply turning the key shown at the top. The main points claimed for this regulator are its simplicity, ease of application and accuracy.

Pressure on Bearing Surfaces.

The pressure which may be permitted upon rubbing surfaces is determined by the velocity of rubbing, the character of the lubricant and the nature of the surfaces themselves. The two surfaces should usually differ, one being hard enough to bear the maximum pressure without change of form, and the other being less hard, in order that it may not abrade the first. With such an arrangement the surfaces, if properly cared for, take a fine, smooth, mirror-like polish and give a minimum frictional resistance. Cast iron surfaces, according to Thurston, unless very large, are less satisfactory than good wrought iron, and moderately hard steel is much better still. A pressure of 800 pounds to the square inch can rarely be attained on wrought iron at even low speeds, while a pressure of 1200 pounds is not infrequently adopted on the steel crank pins of steamboat engines. Pressures from 7000 to 9000 pounds per square inch have been reached on the slow working and rarely moved pivots of swing bridges. Pressures higher than from 600 to 1000 pounds per square inch on iron and on steel are to be avoided, and for general practice the pressure is less as the speed is greater, since the amount of heat developed is directly a measure of the amount of work done in overcoming friction, and is thus proportional to the speed as well as to the pressure.

The Edison Electric Illuminating Co., of New York, have increased their capital from \$1,000,000 to \$2,500,000.

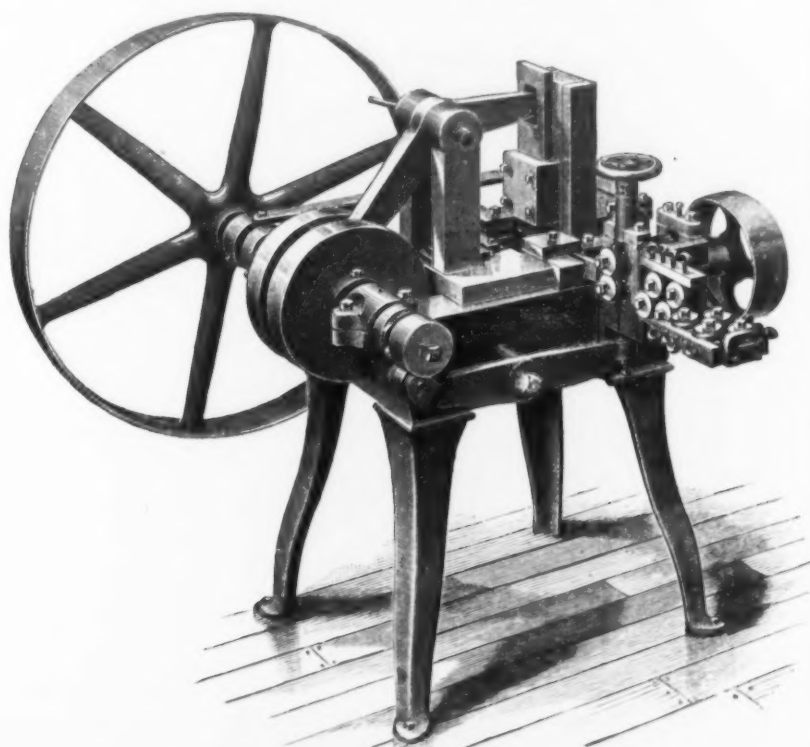


Fig. 2.—Wire-Forming Machine with Double Cam Motion.

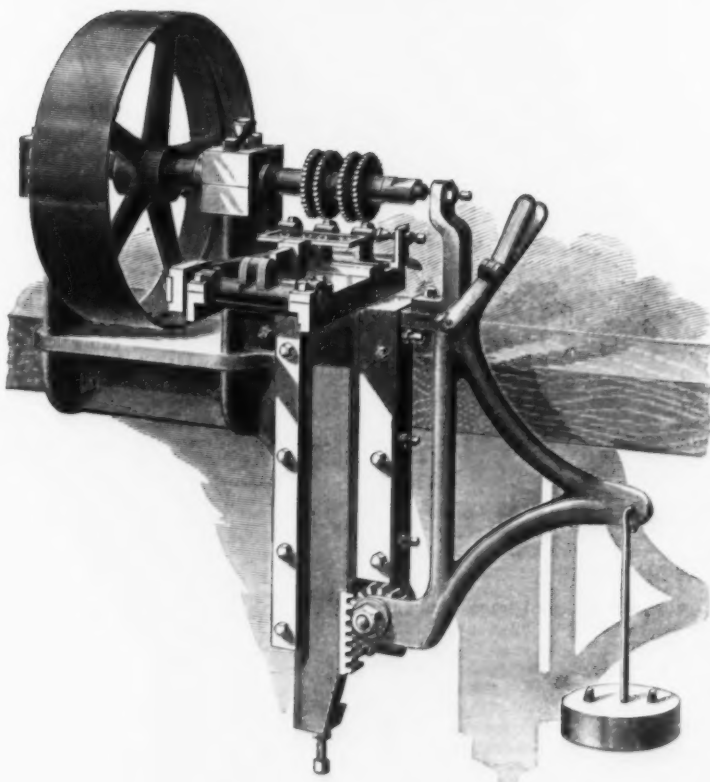


Fig. 4.—Butt Milling Machine.

the article. It can be adapted for using square or flat wire as well as round.

Fig. 4 shows a machine for milling the joints of all kinds of cast butts. It is provided with a self-closing adjustable chuck, and over it is a horizontal steel spindle carrying a gang of adjustable mills. The chuck is fastened on an upright slide, which is raised and lowered by a rack and gear operated by a weighted lever, the extent of the upward motion being regulated by a set-screw. The machine is designed to be attached to an ordinary bench, the spindle to run by a belt from an overhead counter-shaft. The operator stands in front of the machine and with one hand places one-half of the butt in the chuck and with the other releases the lever, which is held by a spring catch; the chuck then closes automatically, holding the butt firmly during the milling operation; when this is completed the operator lifts the lever into the spring catch and the chuck releases the butt. It is advantageous to have two machines, as one operator can run both, milling continuously and matching the butts as fast as done.

which "dead oil," creosote, or any other form of liquid fuel can be had is 1d. a gallon, and at this the supply is very limited. The specific gravity may be taken at not far from 0.9, so that a gallon of it would weigh about 9 pounds, but with coal at 0.05d. per pound we get 20 pounds for 1d., so that, again giving petroleum all the advantage of even numbers in lieu of fractions, it is just twice as dear as coal. To be burned, therefore, with equal economy, it must be twice as efficient; but a practical evaporation of 20 pounds of water per pound of petroleum has never been got. Indeed, this ratio is beyond the theoretical powers of the crude oil. It may therefore be taken as granted that liquid fuel has no claim to be a cheap fuel. At the price of even 3d. a gallon it could not be used at all for making steam, provided coal was accessible. Before proceeding to consider any other aspect of the matter it is well to finish with the question of relative economy. Petroleum is a very difficult thing to burn to advantage, because of the enormous quantity of smoke which it produces. The

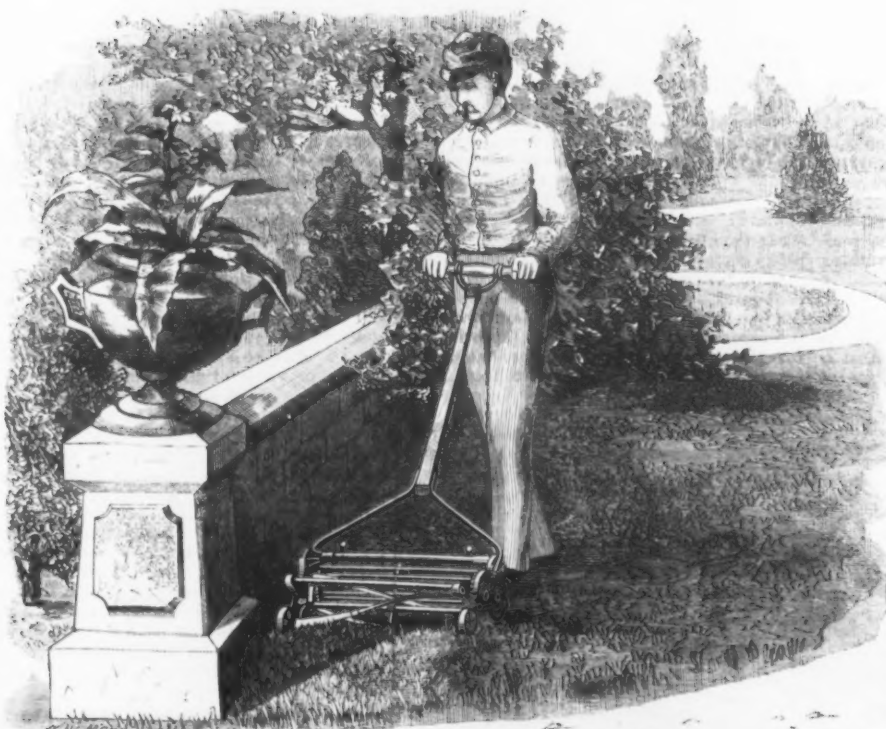
could not keep steam to anything near the proper pressure, and the experiments made at Portsmouth have so far ended in the same way. We do not say that a special boiler may not be devised to get over the difficulty, but in any case it must be, we believe, much larger than the existing type.

A serious objection to the use of liquid fuel is that a very considerable quantity of steam is required to blow the fuel into the furnace. This steam acts on the fuel precisely as it would on water in an injector. It is condensed, and enters the furnace as so much water, which has to be all re-evaporated. It is true that it gives up its heat in the first instance to the fuel, but it makes no return whatever for the second evaporation, which is dead loss. If the steam were not made the second time its use for blowing in the fuel might in one sense be neglected, but with re-evaporation it stands for so much waste of heat. The quantity used has never been ascertained with any precision, but it is of importance. It renders the use of the supplementary feed necessary to keep up the level of the water

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SPECIAL ADVANTAGE, No. 1.

The "NEW EASY" is the *only* Lawn Mower that will cut to within *one inch* of walls, fences, shrubbery, around trees, &c. (See above cut.)

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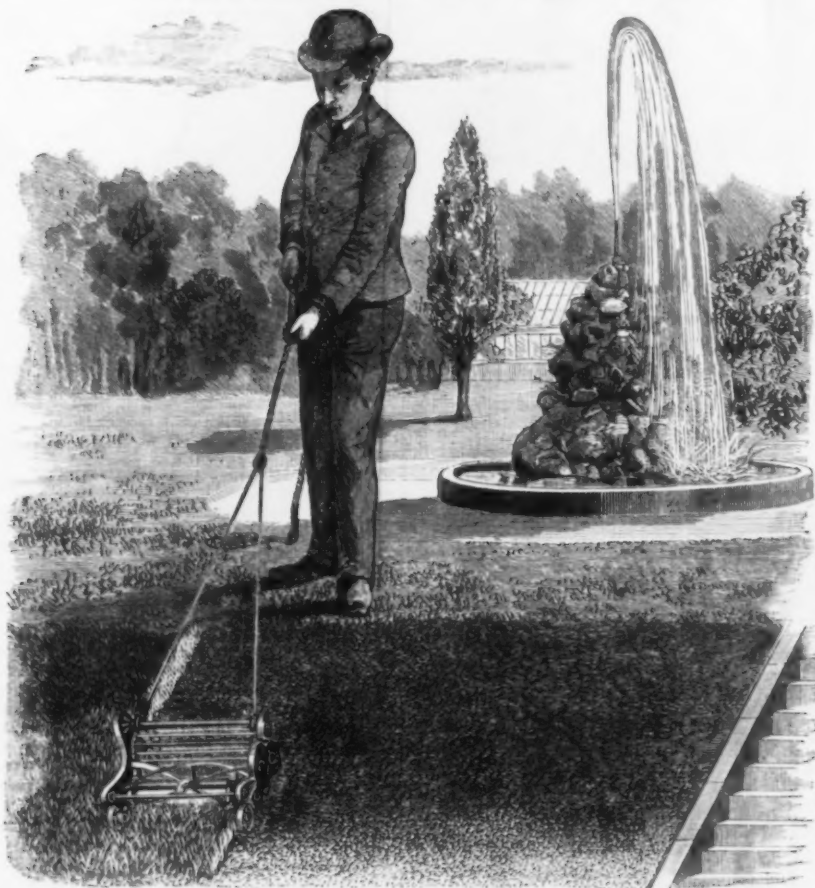
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Do you want to handle the Lightest Running, Easiest Cutting, BEST SELLING Lawn Mower in the market? If you do, examine carefully the merits of the "NEW EASY," and you will know what Mower to buy. No Lawn Mower has yet been made that approaches so near to the ideal Machine for every kind and variety of work as the "NEW EASY." It stands pre-eminent and alone as the only perfect Mower manufactured, and combines the characteristic and exclusive advantages of the front-cut, traction-roller style of machine — viz., adaptability to every grade of lawn work, with extreme ease of operation.



SPECIAL ADVANTAGE, No. 2.

The "NEW EASY" is the *only* Lawn Mower that will run off its level and cut low terraces, mounds, flower beds, &c. (See above cut.)



SPECIAL ADVANTAGE, No. 3.

The "NEW EASY" is the *only* Lawn Mower with sufficient traction to cut high terraces with rope attachment. (See above cut.)

Herewith are illustrated a few of the special uses to which the "NEW EASY" is adapted, and that are not possessed or claimed for any other Mower, while for general purpose work it is *Chief* of the best.



Notice the "New Easy" Lawn Mower and What We Claim for It.

We do not advertise the "NEW EASY" as a Field Mower, nor assert that it will cut grass 12 inches high with perfect ease; but for a Lawn Mower, Strong, Durable, Easily Sharpened and Adjusted, of Varied Capacity, Graceful Form, Long and Pleasing Service, and so easily operated that a lady or child may use it without fatigue, we do claim the "NEW EASY" to be without a rival; and our Agents are authorized to sell this Mower with the express guarantee that these claims shall be verified by trial.



SPECIAL ADVANTAGE, No. 4.

The "NEW EASY" is the *only* Lawn Mower that will cut *narrow borders*. (See above cut.)

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The Lightest and Quietest Running, Best Constructed, Handsomest and Most Durable Rear-Cut, Side-Wheel Mower Made!

Guaranteed first class in every respect, and superior to any other machine of this style in the market.

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THE "Victor" Lawn Mower

Is designed to meet the growing demand for a good, durable Mower at a low price. The "Victor" is a center cut machine, provided with extra large driving wheels, and a noiseless and durable ratchet. The knives are made of the best quality cast steel, and the whole Mower is constructed in a strong, substantial manner, and is offered to the Trade as the best Mower for the price the market affords.

Three Sizes. 12 in. 14 in. 16 in.

We also Manufacture the "BAY STATE" and "VICTOR" Lawn Mowers, herewith illustrated and described.

The Responsibility for Shrinkage in Car Coal Shipments.

According to the *Black Diamond*, one of the most perplexing problems of the car coal trade, and one which requires the exercise of an unusual degree of patience and an intelligent appreciation of the rights of all concerned in the solving of it, is the adjustment of claims for shrinkage or short weight. In the adjustment of claims of this nature miners, shippers and dealers each have rights that the others are morally, if not legally, bound to respect; yet it is too often the case that injustice results to some one of them through the anxiety of all to escape responsibility. The position of the shipper or jobber is probably the most unenviable, for he it is that must stand between miner and dealer and harmonize their conflicting claims—if he can. The assumption by both miners and dealers of the infallible correctness of their respective weights, and refusal of each to recognize, as a basis of settlement, other than their own weights, leave him no alternative but to accept responsibility for the loss. To illustrate: B, who is a shipper, purchases a quantity of coal at the mines and orders it shipped to his customer, C. Upon arrival of cars at destination C has the coal weighed out and finds the quantity received several tons short of mine weight, and he immediately notifies B of this fact and requests that an allowance be placed to his credit for the shortage. B reports the claim of shrinkage to the mines, and is promptly informed the coal was correctly weighed at the point of shipment and that mine weights must govern settlements. C, being duly informed of the mines' ultimatum, notifies B that he will not pay for coal he did not receive, and withholds payment for the shortage claimed.

The foregoing illustrates briefly the practical results of most claims for short weight, and, even though the monotony of such claims (and they are numerous and increasing rapidly) is sometimes broken by various complications, the results are almost invariably the same. The shipper may attempt to locate the loss and fasten it upon some one of the railroads over which the coal was transported, but this is as tedious a process as it is useless, and one might as well seek for a needle in a haystack as to trace for evidence fixing responsibility for loss of coal, in transit, upon any railroad company. Yet there can be little doubt but that the main cause of shrinkage is loss during transportation, and principally from transfers and stealage; but these abuses are not easily remedied, and, being matters of conjecture only, and not susceptible of positive proof in a given case, railroad transportation must necessarily be eliminated as a factor in the problem of short-weight settlements. In our judgment, it seems plain that there is only one way of equitably adjusting these losses. The measure of responsibility for miner, shipper and dealer is the faithful performance of his respective duties in the handling of each car of coal. Assuming, then that each fulfills his obligations to the others in this respect, should one more than another assume the risks of transportation? No reasonable person will for a moment take the ridiculous position that, of three guiltless parties to a bad contract, one more than the others should suffer; yet this is just the predicament the shipper often finds himself in by reason of the unjust position assumed by miners and dealers. It must be apparent to all who have given the subject any thought that miners, shippers and dealers are equally innocent of blame in the premises; why, then, should they not share equally losses arising from an imperfect medium of delivery of coal from the one to the other? No other solution to this vexed question seems practicable, and until all conform to the plan of pro rata settlements that harmony and good-feeling, that identity of interests, so essential to the success of the trade cannot prevail.

TRADE PUBLICATIONS.

Well-Drilling and Prospecting Machinery.

Messrs. Loomis & Nyman, of Tiffin, Ohio, have sent us an interesting catalogue on well-drilling and prospecting machinery. It embraces 64 pages and is replete with illustrations of the different appliances turned out by them. Price lists and tables of sizes are also given.

Boilers and Steam Engines.

An attractive catalogue recently issued by the Bigelow Co., of New Haven, Conn., contains particulars of a large variety of machinery turned out by them, such as portable and stationary boilers and engines, hydrants and water-gates, foundry cupolas, tanks and plate-iron work, &c. The company direct attention to the fact that they have been obliged, by the increased demand for their work, to enlarge their facilities to fully twice their former capacity. The catalogue is profusely illustrated.

Blowers.

Messrs. P. H. & F. M. Roots, of Connersville, Ind., have issued a neat catalogue giving full information concerning their new Acme hand-blower. This device is of special value to blacksmiths and metal-workers, being in every way adapted to the requirements of the smith's forge, at a moderate price. Messrs. Cooke & Co., of 22 Cortlandt street, New York, are the selling agents.

In the course of a discussion at the New England Railroad Club Mr. Coleman called attention to a curious property of steel, and that is that when slightly heated it would crack if bent, and in this he was in turn supported by Mr. Lauder, who gave an account of some experiments that he had made on the subject. He took two pieces of steel, one of Otis and one of Benzoin, cut strips from each and subjected them to all of the physical tests usually employed in testing boiler steel. He bent them double cold, straightened them out, heated to a cherry red, plunged into cold water and bent

double without their showing the slightest sign of fracture. Then taking strips from the same pieces he heated them, after brightening over a piece of hot iron, to the point where the blue just begins to show, and on bending them both showed a wide fracture long before they came down flat.

Rotary Engines with Movable Partition.

Continuing the subject of rotary engines, the *London Engineer*, from whom we have quoted on several occasions, supplies the following under the above head:

Rotary engines of this character are very numerous, and seem at first sight to offer the solution of the problem of producing a direct turning movement of a shaft by the action of steam or other pressed fluid. An engine of this character was devised by Watt, a contrivance which consisted of a radial piston attached to the revolving shaft, and which was made to extend the whole length of a cylinder and revolve within it, its outer edge touching against the barrel of the cylinder. To obtain a steady piece against which the steam might react in its effort against the piston a partition piece was introduced of such a character as to revolve about a longitudinal axis in the cylinder barrel, so as to allow the piston to pass freely when coming up to it, but so arranged as to drop down with its edge against the revolving shaft after the piston had passed. An engine on similar principles has been invented by Mr. John Pinchbeck. The broad character of the Pinchbeck engine is not unfamiliar, but the in-

vents a perforation is made from the hollow of C, leading into the left-hand chamber. When the block B is at its highest point, the eccentric arm of A being vertically upward, the steam is on the point of entering, as at this time the blanks between the channels of C are about to cease blocking the channels in B. A slight movement and the steam enters, filling the chamber to the left, and forcing round the eccentric cylinder and the shaft to which it is secured, in the direction of the arrow. The steam on the other side exhausts freely through E. As the revolution continues the ports open wider and wider, until the shaft has turned through 45°, after which it begins to close, contracting gradually until the angle becomes 90°, when they close entirely and are situated as shown in Fig. 1. The remaining half of the revolution is obtained by the expansive action of the steam, the ports during this period remaining closed.

If a single engine were employed the momentum of the machinery would have to carry the revolving cylinder past its upper vertical position, as in this position the chamber is not divided by the partition. The peculiarity of this engine lies, however, in the use of two cylinders, not so much to avoid dead points as to obtain a mutual action between the reciprocating blocks. The second cylinder and its mechanism are so disposed that the upward movement of the block in the one engine carries out the downward movement of the block in the other, a suitable lever connection being employed. This second engine and the arrangement of its parts can be seen from the longitudinal section, Fig. 2; the fittings are the same as in the other, but so placed

revolving shaft square, the shaft being forged square and passed into a square hole in the cylinder. A little play being purposely allowed, set-screws are so placed as to set the revolving cylinder outward against the fixed. A fair surface contact is obtained here because of the similar curvature. For the sides of this piece metallic rings *m* are fitted in annular grooves running around the ends as near to the outer edge as possible, and kept against the sides of the fixed cylinder, as with the packing of an ordinary piston. To prevent dirt obtaining access to the working parts the upper part of the machine is closed by a light cover. An engine of this description with 8-inch cylinders will develop a brake horse-power of about 5, running at 450 revolutions, with a steam pressure of 45 pounds on the square inch. With duplicate valve gearing and duplicate steam and exhaust channels this engine can be made reversible.

The Bannison engine, which is manufactured by the same firm as the previous engine, Messrs. R. Waygood & Co., may be said to be in some respects the converse of the Pinchbeck engine. In the Pinchbeck engine the sliding partition is moved in a fixed frame by the revolution of an eccentric cylinder; in the Bannison the sliding partition is moved in a revolving frame by the action of a fixed eccentric piece. The simple movements of this engine can be seen from Fig. 3. A fixed cylinder is so shaped that a radial partition, A, while revolving about its axis, is compelled to take an eccentric course. To accomplish this completely an inner fixed cylinder is shaped so as to have a similar eccentricity with the outer, there being a constant radial distance between them. Turning on this central cylinder is a cylindrical piece, B, whose outer surface touches that part of the outer cylinder which penetrates furthest into the interior. The piece A is paired with piece B by means of a longitudinal slot in B, to allow of A sliding in and out as it is acted upon by the fixed eccentric surfaces. This formation extends the whole length of the cylinder. Upon turning the shaft B the chamber between one side of the partition A and the fixed eccentric abutment from the large cylinder increases, that on the other decreasing. Suitable steam and exhaust channels being provided at S and E, one chamber is expanded by the action of the steam, the other being opened out to exhaust, the consequence being that the piece A is forced round, carrying with it the shaft piece B. As A comes up on the other side of the eccentric abutments it sinks back into B, reappearing as it comes out on the other side; the above action is then repeated and continuous rotation kept up. The actual Bannison engine differs from this in having four rotating sliding blocks, two opposite eccentric abutments on the same cylinder, and in having the steam and exhaust passages so dis-

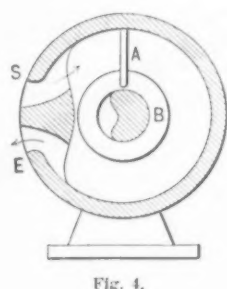


Fig. 4.

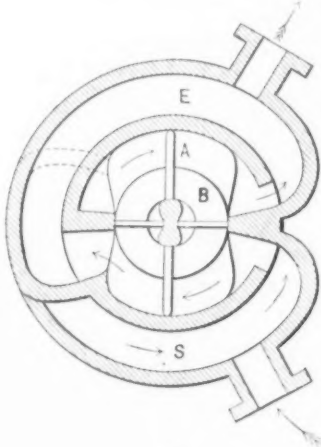


Fig. 5.

Bannison's Engine.

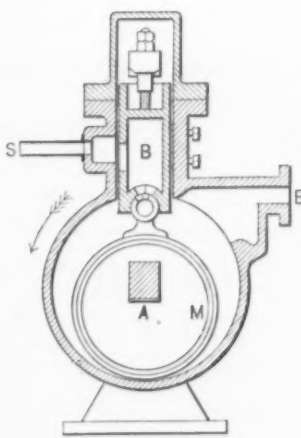


Fig. 1.



Fig. 3.

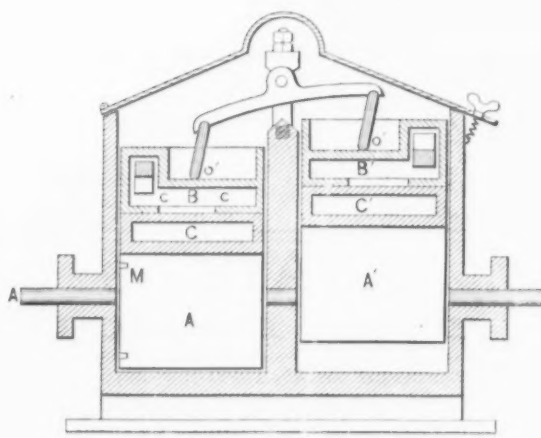


Fig. 2.

Sections of the Pinchbeck Engine.

ROTARY ENGINES WITH MOVABLE PARTITION.

genious combination by which the working pieces mutually support each other in preserving secure joints is one of novelty and one which greatly adds to its efficiency. The main mechanism is an eccentric cylinder revolving with a shaft whose axis coincides with that of a larger and fixed cylinder in such a manner that the outer edge of the revolving cylinder is always in contact with the interior surface of the fixed cylinder. The eccentric piece A is always pressed against by a sliding piece, B, a piece extending the whole length of the cylinder and constrained by appropriate guides to move radially to the fixed cylinder. The eccentric itself causes this piece to rise, the downward movement being produced by an external force. Effectually to complete the combination, an intermediate piece, C, is introduced, and paired as shown by fair cylindrical surfaces to the steadiest pieces A and B. If this mechanism be set in motion by turning the shaft A connected to the eccentric cylinder A, the two chambers, into which the partition B divides the space between the eccentric piece and the cylinder in which it works, become alternately expanded and contracted. Steam being admitted to the expanding chamber and allowed to exhaust from the contracting one, the contrivance is set in motion.

This distribution of steam is carried out in a novel manner. In many of these engines this is obtained by channels cut in one of the steadiest pieces working against a surface in the fixed frame provided with suitable steam and exhaust ports. In this case the ports are constructed in the intermediate piece and in the moving piece with which it is joined. The cylindrical part of C is hollow, and is perforated as shown by the black spaces, these perforations extending from *c* to *c*, as indicated in Fig. 2, a longitudinal section. Similar spaces are provided in the lower part of B, which is also hollow to allow of the steam passing through to them. Steam enters by the pipe S into the casing inclosing B; the orifices cut in the side of B facing this pipe must evidently be of such a depth as never to obstruct the flow of steam in its reciprocation. The exhaust channel E is situated on the other side of the partition. To complete the steam-entry arrange-

ment a perforation is made from the hollow of C, leading into the left-hand chamber. When the block B is at its highest point, the eccentric arm of A being vertically upward, the steam is on the point of entering, as at this time the blanks between the channels of C are about to cease blocking the channels in B. A slight movement and the steam enters, filling the chamber to the left, and forcing round the eccentric cylinder and the shaft to which it is secured, in the direction of the arrow. The steam on the other side exhausts freely through E. As the revolution continues the ports open wider and wider, until the shaft has turned through 45°, after which it begins to close, contracting gradually until the angle becomes 90°, when they close entirely and are situated as shown in Fig. 1. The remaining half of the revolution is obtained by the expansive action of the steam, the ports during this period remaining closed.

A good many joints require attention in this engine. There are the fronts and sides of the reciprocating block; the connections of the intermediate piece C with the reciprocating block, with the surface of the eccentric cylinder and with the sides of the fixed main cylinder; also the jointing of A with the inner surface of the fixed cylinder and with its flat ends. The large faces of the sliding blocks work against a flat plate, shown on its right in Fig. 1, which can be adjusted by set-screws; the ends have cross strips of metal fitting in corresponding recesses, and kept up against its surface by springs behind, shown in Fig. 3. The port faces, or connection between the pieces C and B, are accurately fitted, the ends of C having strips kept against the rubbing surface by springs, as indicated in Fig. 3. The face of this piece toward the turning cylinder is well fitted, this, as well as the port face, being kept up to its work by the external force acting on the reciprocating piece above, derived from the action of the neighboring engine. The touching surfaces between the eccentric cylinder and the fair cylinder is rendered effectual by making the connection between this cylinder and the

posed as to well balance the machine when at work. If used as in Fig. 1, there would always be a considerable axial pressure—a pressure caused by the unbalanced steam force on A pushing the drum B hard against the axle passing through it. This force causes a considerable amount of wear in the axles or bearings of many engines, an action which might be termed a rimming out of the bearings. By placing four sliding pieces A equidistant around the revolving piece B, the ports being arranged as shown, so as to admit steam on opposite blades and exhaust from opposite blades, it is clear that the axle having equal opposite forces on either side is relieved from any pressure.

No separate valve gear is employed; the revolving blades or pistons passing the ports cause the steam to act upon them at the proper time. The several joints are not generally fitted with special packing arrangements for preserving tightness. The ends of the blades, where pairing with the fixed cylinder, are rounded and touch home as they revolve, an extra security resulting from the centrifugal action set up forcing them out against their working surfaces. Where the blades pass into the drum the surfaces are flat and accurately fitted, a treatment which appears to secure proper tightness. This joint is aided greatly by the peculiar action of the engine, which is such that when the steam is exerting a force on one side of a blade—this being the case when it is moving through the upper and lower quarters between the eccentric abutments—the blade is stationary toward the turning drum, and is held against the side of the slot by the force of steam, thus assisting to keep it tight. As the blade passes the abutments there is an equal pressure on both its sides, as at this time it is passing a port. It is therefore free to pass into the slot by the action of the abutments, and no leakage can occur, as the pressure on each side is the same. Similar remarks apply as it passes outward, after turning past the extreme position. The power exerted by this engine is fairly large for its size, a result due to the fact that one revolution of the shaft gives opportunity for two cylinder volumes of steam to do work. There being four blades, each of which is acted upon

through two quarters of the cylinder in a revolution, the aggregate volume swept through is evidently twice that of the cylinder. This engine is as much used as a pump as a motor, a 14-inch pump delivering over 1000 gallons of water while running at 200 revolutions per minute, and this water delivered, as might be deduced from the examination of its construction, in a steady stream.

Continental Statisticians on the Decline of British Trade.

Continental statisticians have recently been engaged in compiling an array of figures going to show that of late years British foreign and colonial trade has declined, while that of the Continent has been gaining. Some of the statistics from which they draw their conclusions may be briefly noticed. British import amounted in November last to £29,883,763, being £868,685 less than in November, 1884; the export was £16,464,250, or £1,239,963 less. The decrease of import during the 11 months of the year was £13,998,853, and of export £19,260,403. The share of Great Britain in the world's trade as compared with that of other countries underwent, according to the statistics from which we quote, the following changes:

	Great Britain.	All other countries.
1868.....	24 1/2 %	75 1/2 %
1875.....	21 1/2 %	78 1/2 %
1882.....	19 1/2 %	80 1/2 %

European foreign trade alone:

	Great Britain.	Continent of Europe.
1868.....	31 1/2 %	68 1/2 %
1875.....	28 1/2 %	71 1/2 %
1882.....	26 1/2 %	73 1/2 %

So far as English returns show, the decline of foreign and colonial trade has made further progress during the past three years, but from different causes. While the decline between 1875 and 1882 was chiefly due to Germany, France, Austria, Russia and Italy adopting protective tariffs, and to a considerable extent shutting out British goods, the decline since 1882 has arisen mainly from general stagnation in trade all over the world, in consequence of the depreciation of raw material, crippling the purchasing capabilities of the tropical countries in particular—we mean the decline in sugar, coffee, india-rubber, hemp and cotton. All countries exporting manufactured goods to those countries have seen their trade decline, England, the Continent and the United States alike. Besides, if England's import figures have gone on declining of late years, this has been due in a great measure to the greater cheapness of the articles named and of other raw material, as well as of half-manufactures and manufactures.

We fear that Continental statistics based entirely on values are calculated to mislead. Too much dependence should not be placed on them, especially when applied to a country doing the enormous business England transacts all over the globe. If statistics were carefully prepared based on the weight of goods instead of on the value, or on both together, it would, we think, be seen that England's decline in foreign and colonial trade as compared with that of the Continent is not quite so bad as the French and other economists would make it. Besides, between 1868 and 1882 the world's trade increased 50 per cent., and it was hardly to be expected, in this great development, that England's percentage of the total trade would be as large at the end of the period named as at the beginning. The change in Continental fiscal policy undoubtedly curtailed English export in that direction, but, as we have shown in our articles on Indian and Australian trade, both the import and export to and from those colonies and England have been steadily on the increase. Long before 1879 English manufacturers were aware that the industrial advancement on the Continent would by degrees cause that market to become less valuable to them, that both coal and pig-iron production especially would go on increasing abroad, and that in these two items at least English supremacy would therefore be on the wane. A few figures will show this decline:

	Coal Production.	Other countries.
1868.....	53.9 %	46.1 %
1876.....	47.4 %	52.6 %
1882.....	41.6 %	58.4 %
1883.....	40.7 %	59.3 %

But this does not imply that what was produced in England was on that account any less profitable during the interval.

That cotton industry on the Continent should gradually reach large proportions was natural, and in this item, too, England has lost much of her European supremacy, as the following figures show:

	Cotton Consumed in Europe.	On Continent.
1860.....	60.3 %	39.7 %
1868.....	58.8 %	41.2 %
1883.....	52.3 %	47.7 %

But even in this branch of industry it is by no means proven that the profits accruing were any less in England during the interval. If trade and industry have been dull in England for a year or two past, they have also been dull on the Continent and in this country, and the figures which Continental statisticians produce do not in the least convince us that there is decadence of an alarming, and possibly lasting, nature in British foreign and colonial trade. We may well believe that British manufacturers and merchants are alive to the conditions of the present time, and, though conservative, are not slow to take advantage of any trade opening that may offer. The fact is that Continental nations have neither the money, nor the credit, nor the connections, to out-Great Britain from her position as the leading commercial nation, and we think it will be many years before they are in a position to seriously cripple her trade, unless British statesmen should involve her in disastrous wars with first-class maritime powers.

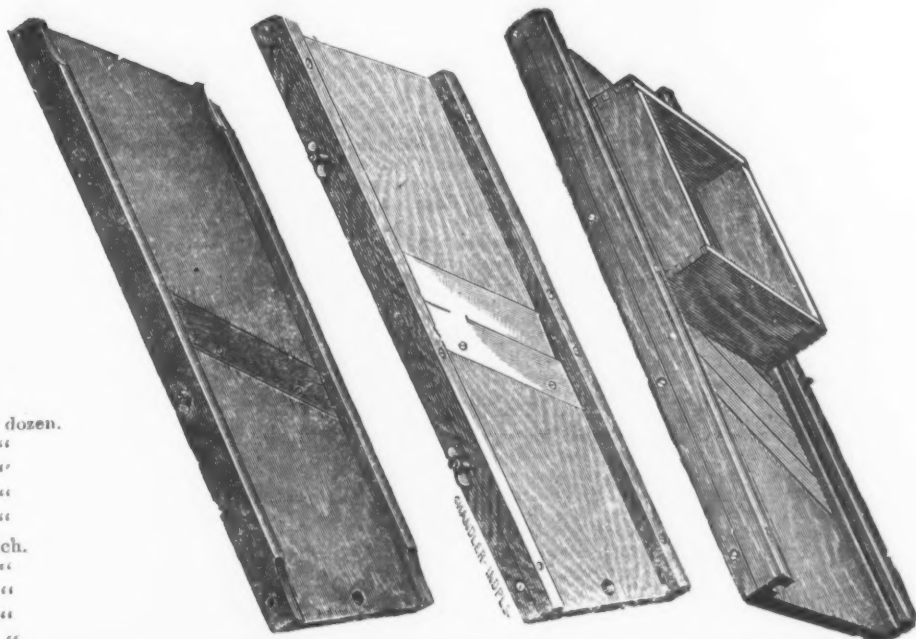
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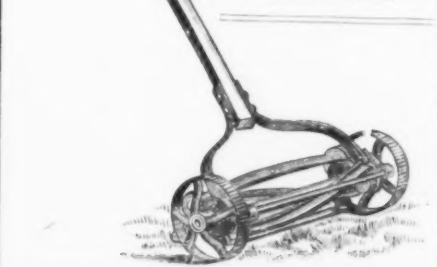
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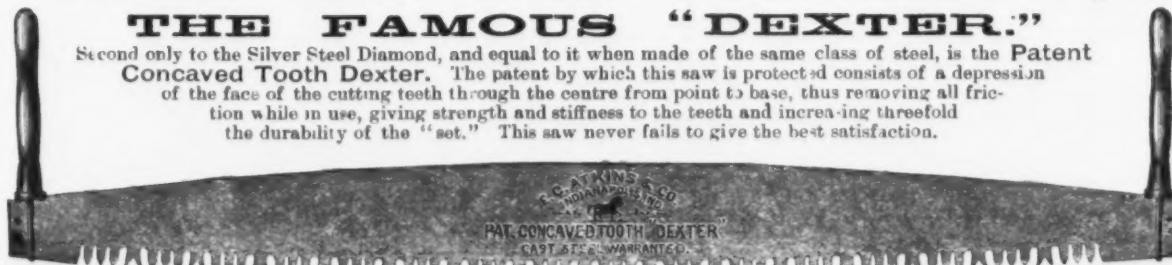
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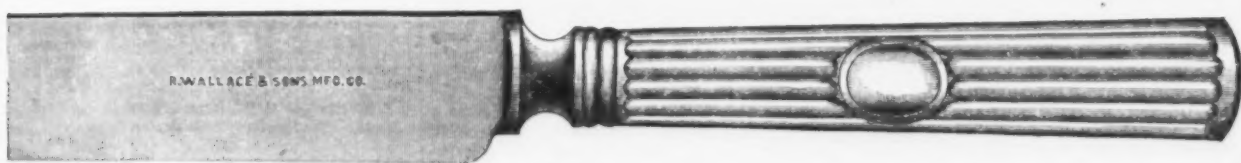
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THE WEEK.

Natural gas is now being successfully utilized as a street cleaner. At Beaver Falls, Pa., a hose with perforated metallic nozzle was attached to the main, the gas was ignited, and the mountains of snow that blocked the street were reduced to water in a few minutes by a powerful stream of hissing blue fire. Pittsburgh people are now talking of applying the same system on an extensive scale.

The Board of Supervising Inspectors of Steam Vessels, in session at Washington, unanimously voted in favor of the repeal of the last paragraph of Section 14, Rule 2, relating to the use of upright tubular boilers, which was adopted at the last annual meeting of the Board.

There are now in the Southern States 139 cotton-seed mills. In 1866 there was not one.

At the annual meeting of the Portland, Me., Board of Trade, the secretary's report showed that the European trade through that port is now steadily improving and will probably reach \$12,000,000 in value the present year.

The Treasury Department is in receipt of information that the Government of the Netherlands is considering a proposition to assess a duty on petroleum and ship timber, articles which have hitherto been on the free list. This action, it is intimated, is intended to be in the nature of a retaliatory measure against the United States on account of its alleged discrimination against the importation of Sumatra tobacco into this country. It is likely that the matter will be brought to the attention of the House Committee on Ways and Means.

Tiffany & Co. some time ago imported a lot of bronze statuettes and Collector Hedden collected 45 per cent. duty on them, claiming that they were manufactured bronze. The firm claimed that they were the work of professional artists and could only be subjected to 10 per cent. duty. Judge Shipman, in the United States District Court, recently gave a verdict in favor of the importers.

The proposed addition to the Museum of Natural History in Central Park will cost \$325,000.

The Misses Drexel, who inherited from their father, the late F. A. Drexel, of Philadelphia, a fortune of \$12,000,000, have just purchased 200 acres of land near Bristol, Pa., on which they will establish an industrial school and home for orphan boys.

The value of manufactures in San Francisco for the year 1885 is estimated at not less than \$90,000,000, against nearly \$78,000,000 in 1880, as shown by the census, or nearly three-fold that of 1870. Foundry-work and whale oil refining are among the latest additions to local industry.

The National Board of Trade convened in Washington City on the 20th inst., Frederick Fraley, of Philadelphia, presiding, and after discussion resolutions were adopted by a vote of 32 to 10 declaring "the necessity of adopting the same methods pursued by our competitors to establish quick and frequent communication with foreign markets, and place our shipowners upon an equal footing with those of other countries; also that it is expedient for the National Government to assume the full expenditure authorized by law for the carriage of the mails to foreign ports in American vessels." Senator Dolph took occasion to make an attack upon the Beck Free Ship bill by saying, while he desired to see the American flag upon every sea and at every port in the world, he only wished to see it flying from vessels built in the United States and representing American capital, enterprise and industry.

The New York State Comptroller submits his report for 1885, showing that the surplus September 30 was \$2,711,144, exceeding the estimate, but this surplus has not been actually collected, and the condition of the treasury is not altogether satisfactory. The Legislature is warned of the necessity of more regard for the finances. The tax rate for the current year is 2½ mills, which, upon the present valuation of \$3,094,731,457, will produce \$7,696,405.11. The receipts from corporation tax for the last year were estimated in the report for 1885 at \$1,600,000. The actual receipts were \$1,673,879.09.

A dispatch from London says that at the instance of England the six great powers have notified Greece that a naval attack by Greece upon Turkey will not be permitted, and the admiral of the Mediterranean fleet has been ordered to take action should Greece disobey the powers.

The report of the New York Fire Commissioners shows that there were 2479 fires last year, which caused an aggregate loss of \$3,759,283. The number of new buildings erected, planned or begun was 3368; their estimated cost was \$45,374,013. There were 2596 buildings altered at an expense of \$7,594,825. The number of buildings completed was 2882. The recent census shows that there are 104,012 buildings exclusive of sheds in the city. There are 14,199 buildings over four stories high, and 522 fire-proof buildings.

Circulars have been sent to Washington by some of the leading railroads of the Northwest urging a reduction in the tariff

on steel rails. The circulars claim that the railroads are entitled to as much protection from the Government as the rolling mills, and states that few of the railroads can do more than to pay fixed charges and reasonable interest.

The American Society of Civil Engineers number 928 members. At the annual meeting held on the 21st inst., the following officers were elected: President, Henry Flail, of St. Louis; vice presidents, Thomas C. Keefe, of Ottawa, Canada, and Thomas F. Rowland, of New York; secretary and librarian, John Bogart, of New York; treasurer, James R. Croes, of New York; directors, George S. Green, Jr., William R. Hutton and W. Howard White, of New York; Henry G. Morris, of Philadelphia, and Charles L. Strobel, of Chicago. Elliott C. Clark, of Boston, won the Norman medal for the best paper on any engineering subject submitted during the year, and A. M. Wellington, of the Railroad Gazette, was awarded the Rowland prize for the second best.

The tramp steamer Hylton Castle, of England, from New York to Rouen with a cargo of grain, foundered off Fire Island. An iron plate in her hull is supposed to have given way under the buffeting of heavy seas.

The most recent estimate that has been made by the French engineers in regard to the proposed African inland sea is that the undertaking could be consummated in the maximum period of five years at a cost of about \$30,000,000, it being sufficient to cut, in the alluvial part of the region traversed, a canal averaging some 80 to 100 feet in width, which would be further widened by the action of the current.

The efficacy of iron bulkheads in steamships was strikingly shown in the case of the steamer Crystal, bound from Newcastle to New York, which was 10 days at sea with fire in her main hold. By closing every aperture which could admit air to the cargo the steamer was kept afloat until fireboats came to her relief in New York harbor. The damage was about \$10,000.

Of no less than eight bills now before Congress in some way closely related to the shipping interests of the United States it is remarked that but one of them, which approves in substance of the French bounty scheme, has received the formal endorsement of the New York Maritime Association. This alone in their judgment apparently giving promise of adequate relief.

The annual report of the Reading Railway Co. shows that the net earnings for 1884-85 were \$12,652,249; deficit in earnings of the Coal and Iron Co., \$124,679; for both companies, net earnings, \$12,527,569. The deficit in the operations of the New Jersey Central Railroad was \$1,338,377.

Manufacturers are locating in New York in larger numbers, attracted by the facilities for doing business and the advantages of direct transportation to various markets. Park Commissioner Crimmins says: "The great point, they tell me, is that they can get better rates from here and can have better and more direct communication with their customers from this great center than elsewhere."

The New York Steam Co. have offered the use of its mains and pipes to the City free of cost to convey steam or water through in case of fire. The company "agree to put in place in the dry-goods district all necessary mains, with provision for service laterals, to enable steam or water at will to be delivered in sufficient supply for all possible demand for fire or other purposes."

The Delaware Ship and Engine Building Co., of Chester, Pa., are laying the keel for an iron steamship for the United States and Brazil Mail Steamship Co. She will be 324 feet long over all, 42 feet beam, and 24½ feet depth of hold from the top of ceiling to main deck, being designed for large cargo capacity. Her engine will be 38 x 74 and 54-inch stroke, developing between 2100 and 2300 horse-power, which will drive her at a high rate of speed. She will have a cut-off on high and low pressure cylinders. The Alliance, as she will be called, is the first of three new steamers to form a direct line from New York to Buenos Ayres via Rio de Janeiro, and will be placed on the route next fall.

The supervising inspectors of steam vessels organized as a board form an inspecting body, about one-half of whom are engineers and machinists and the rest masters and pilots, as follows: President, Jas. A. Dumont, Washington, D. C.; Jas. C. Bemis, San Francisco, Cal.; Geo. H. Starbuck, New York, N. Y.; James Curran, Baltimore, Md.; David B. Asbury, St. Louis, Mo.; George Hays, St. Paul, Minn.; Irwin Dugan, Louisville, Ky.; Americus Warden, Cincinnati, Ohio; Wm. M. Daly, Detroit, Mich.; Wm. D. Robinson, Buffalo, N. Y.; Matt. O'Brien, New Orleans, La.

In 1879 and 1880 the City imposed taxes upon the New York and Harlem Railroad Co. upon a valuation of \$3,000,000 for the tunnel, tracks, roadbed and masonry under Fourth avenue between Forty-fifth street and the Harlem River. The Supreme Court in an appeal against the tax commissioners decided that the company was only liable to taxation upon the railroad structure, consisting of the roadbed, rails and station-houses. A further appeal was taken by the

City to the Court of Appeals, upon which a decision was announced this week sustaining the action of the commissioners and reversing the decision of the General Term. The tax imposed upon the tunnel from Thirty-fourth to Forty-second streets was also sustained by the court. The result of the decision is to authorize the City to impose taxes upon the railroad company for the value of the several structures.

During last year 3451 buildings were erected in St. Paul, valued at \$7,234,834. In Minneapolis 3370 buildings were erected, valued at \$9,075,000. These figures are from a Minneapolis paper, and may be colored by municipal jealousy.

At Youngstown, Ohio, an explosion of melted metal in the mills of Brown, Bonnell & Co. scattered debris in every direction and hurled iron through the roof. Several workmen were injured.

The annual report of the New York Railroad Commission for the year ending September 30 last shows that an enormous business was done notwithstanding the unprofitable rates, the gross earnings being \$111,632,961.47, as against \$120,227,871.72 the year before. The operating expenses were about \$6,000,000 less than in 1884. The report says: "Probably for the first time since railroads have been run within the State of New York can it be said that a year has elapsed without a single passenger being killed from causes beyond his own control. Such was the fact for the fiscal year ending September 30, 1885." Thirty-nine drunken persons were killed.

The Clyde statistics for 1885 tell the story of the gain made by steel on iron during the year. Of all the tonnage constructed and launched on the river last year steel showed a percentage of 48. No further back than 1879 the percentage of steel tonnage produced on the Clyde was only 10½. The North German Lloyd now has three new steel steamers under headway at Govan, near Glasgow, and the Havre line gives its orders for four more vessels of steel to the St. Nazaire shipyard in France, all of which will be splendid additions to the steel fleet already in existence.

The Union Ferry Co.'s franchises are to be sold at public auction, by order of the Sinking Fund Commissioners. The upset price will be 11½ per cent. of the gross earnings.

Resolutions appealing to Congress against the construction of the proposed bridge across Staten Island Sound were introduced into the New Jersey Legislature on Monday and referred to the Commission of Riparian Rights by a vote of 35 to 20.

Lord Salisbury has consented to recognize China as nominal suzerain over Burmah on the condition that the Pekin Government abandon its claim to tribute from Burmah and open the Chinese frontier to British traders at 5 per cent. ad valorem duties, except on opium.

James B. Colgate, bullion dealer, of Wall street, has been adjudged by Judge Van Hoesen a general partner in the insolvent firm of H. Humphrey, and a judgment for \$82,203.94 directed against him in the suit of the Manhattan Co.

The suit of Frothingham and others against Jacob Sharp and his associates of the Broadway Railroad Co. to compel an accounting for the \$2,500,000 mortgage, the proceeds of which are supposed to have been used in buying the Legislature and the Aldermen, came up before Judge Van Brunt, and is likely to be pushed with vigor.

A new car heater, by which street cars are said to be heated at a cost of between 25 and 35 cents for 24 hours, was experimented with in Chicago a day or two ago. The apparatus is placed under the car, the interior of which it heats by sending in currents of air that pass through a fire-box in which fire-clay is heated to a white glow by means of coal oil.

The report of the Fortification Board submitted to the President estimates that \$126,000,000 will be required for an adequate system of coast defenses, and calls for the immediate appropriation of \$21,000,000 for plant wherewith to begin the manufacture of heavy ordnance.

The report of the State commission on the condition of the laboring classes in this city, more especially the occupants of tenement-houses, discloses hardships and privations in the struggle for bread which are a reproach to civilization, but the public ear is already wearied with exposures of this character, and relief is yet to come.

The Boston Chamber of Commerce has adopted a resolution declaring itself "in full sympathy with the movement of the New England Manufacturers' and Importers' Union and other business organizations to prevent fraud in the undervaluation of invoices at custom houses."

Wm. E. Crandall, whose skill as a ship-builder was shown in designing the steamer Pilgrim, died last Thursday in Newport, R. I.

Judge Brower, of the United States Circuit Court at Topeka, Kan., in a suit to recover the value of brewery property made useless by the prohibition law, decides that "when the right to use property in a given way is vested in a citizen it cannot be taken

from him for the public good without compensation. Beyond any doubt the State can prohibit the defendants from continuing their business of brewing, but before it can do so it must pay the value of the property destroyed."

A serious fire occurred in the cotton warehouses at Tompkinsville, Staten Island. The net loss on the contents is estimated at \$150,000.

The State Trades Association in session at Albany elected Samuel Gompers, of New York, president; secretary, Geo. A. Perry, of Rochester.

The ship Frank N. Thayer, from Manila to New York, was burned at sea with a cargo of hemp valued at \$250,000.

It is stated that a concession has been granted by the Swiss Government to a firm of electrical engineers at Geneva for making a railway up Mont Salève, near that place. The line will be made with a central rack very similar to that of the Righi line, the toothed pinion which works into it being driven by machinery.

The New York Industrial Education Association are preparing for a Children's Industrial Exhibition, to be held in this city during the last week in March. This society professes to encourage and facilitate the training of children to use their hands in useful and ornamental work.

The bill appropriating \$450,000 for the purchase and alteration of the old Produce Exchange, in this city, for army purposes has passed both houses of Congress.

A company has been organized with a capital of \$15,000,000 to build a railroad from the head of Lake Superior to the Southwest, through Minnesota, Dakota and Nebraska, with a branch line to the Iowa coal fields.

The water rents in New York City for 1885 amounted to \$2,122,411.

The dynamite magazine of Flannigan & Co., at shaft 14 of the new aqueduct, blew up on Friday night and caused wide destruction. There were 250 pounds of dynamite in the magazine, which was connected by a steam-pipe with the engine-house of the shaft, about 200 feet away. The dynamite is kept frozen to increase its explosive powers, and when it is needed it is set near the steam-pipe and gradually thawed out. It is supposed that this pipe became too hot and caused the explosion.

According to Mr. Charles A. Ashburner, the geologist, the total oil products of Pennsylvania, including a small oil basin in southern New York, up to January 1, 1885, have been the enormous sum of 261,000,000 barrels. The value of the product at \$1.65½ per barrel, which has been the average price since the first discoveries were made, would sum up the enormous sum of \$426,300,000, a much larger sum than the present annual revenue of the United States. All this immense wealth has been obtained from an area of 369 square miles, divided into six basins or districts, having produced thus far 846,000 barrels to the square mile.

A remarkable explosion which occurred in Germany shows the force possessed by dust. A sack of flour, falling down stairs, opened and scattered the contents in a cloud through the lower room, where a burning gas-flame set fire to the dust, causing an explosion which lifted a part of the roof of the mill and broke almost all the windows.

Robert M. Hasbrouck, a prominent civil engineer, died at his residence on the 18th inst., at Schaghticoke, near Troy, aged 63 years. For a number of years he was engaged on the Erie Canal and Croton Aqueduct as engineer, and was one of the constructing engineers of the High Bridge. He was City Engineer of Troy for a long time, and for the past two years he has been Deputy State Engineer.

The Poughkeepsie Bridge Co., who have two piers partially built preparatory to crossing the Hudson River, propose to issue \$5,000,000 of bonds and complete the work. J. H. Appleton, of Springfield, Mass., is the new president.

Chief Engineer Church proposes to cover the new aqueduct for a distance of 31 miles from this city with a brick arch, to cost \$150,000 a mile.

A kerosene engine at Manchester, N. H., exploded and killed Timothy Stevens, the inventor.

The project of a submarine cable from San Francisco to Australia and New Zealand has been revived by an English syndicate, and Randolph Want, Solicitor General in London for the New South Wales Government, has arrived in San Francisco to await the arrival of his associates to further the project.

The West Shore ferry-house, at the foot of Forty second street, was burned on Sunday morning, causing a loss estimated at \$100,000. It was a frame structure covered with corrugated iron.

Dr. Edson, of the Health Board, is proceeding vigorously against the use of beer faucets or pipes made of brass, lead, copper or other dangerous metal. The orders which are being sent to liquor dealers specify no particular material for the faucets, but re-

quire that they shall not be made of any substance that will form unwholesome or deleterious compounds, according to Section No. 208 of the Sanitary Code.

The City of Chicago has 1100 miles of telegraph wire underground, and according to the city electrician the system is working successfully.

A number of Chinese have begun suit in the United States Circuit Court at San Francisco against the city of Eureka, for \$132,000 damages for losses of property alleged to have been sustained by them at the time of their expulsion from that place, nearly a year ago.

An explosion of gases in the coal mine at Newburg, W. Va., caused the instantaneous death of 39 men, whose bodies were disfigured beyond recognition.

The Ordnance Commission, of which Mr. Randall is chairman, it is thought will recommend a large appropriation for the purchase of steel ingots from American manufacturers, to be used in the construction of guns of 10 and 12 inch caliber at the Washington Navy-Yard and at the Watervliet Arsenal. The Commission think it best to make no larger contracts for the purchase of steel at the beginning than will be necessary to warrant manufacturers in putting up the plant necessary to cast ingots of the required dimensions. If the guns made therefrom prove satisfactory larger appropriations will no doubt follow.

Senator Warner Miller, it is reported, will soon introduce a bill invoking the aid of the National Treasury for enlarging the Erie Canal. He argues that, as the commerce of the canal is largely the products of other States, and the benefits are common to the States from which the products are shipped, the Government should assume the expense of its improvement and maintenance, but does not say that the State would be called upon to reciprocate the favor in much larger amounts.

Forty-one naval cadet engineers, who had graduated and afterward been dismissed from service by Secretary Chandler, were on Monday restored by order of the Supreme Court.

A Baltimore gas company, who use the latest patented processes, offer to sell their product at 50 cents per 1000 cubic feet.

The success of linseed culture in the Argentine Republic would seem to be assured. This season's crop in the valley of the Rio de la Plata will be 200,000 tons, and predictions are made that 1,000,000 tons will be raised during the coming twelvemonth.

The New York Board of Trade calls on the State Senate to investigate the telephone business, alleging that the charges in this city for the use of a telephone were from \$12.50 to \$15 per month, while the charge in Baltimore is from \$4 to \$7, in San Francisco it is \$5, and in New Haven from \$2.50 to \$6.

A steam bicycle has been built in California which has made from 12 to 15 miles per hour. It has a 51-inch driving-wheel, and an engine and boiler which weigh less than 20 pounds. These are mounted over the small wheel, which is run ahead of the larger one. With a proper engine, so it is claimed, there is no reason why one of these machines should not be capable of making 20 miles an hour continuously. The power needed for the purpose would be less than half a horse-power, and the weight of the machine need be increased very little by the addition of the engine.

John Roach, the shipbuilder, was one of the most conspicuous figures at the meeting of the Irish Parliamentary Fund Association at the Hoffman House on Monday evening. He contributed \$100 to the fund as "an old and veteran skilled mechanic."

The National Association of Marine Engineers, in annual convention at Buffalo last week, urged Congress to encourage the reconstruction and reactivation of the mercantile navy of the United States.

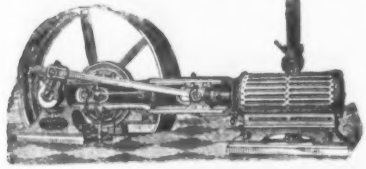
Notice is given in the Assembly that \$1,100,000 will be needed for the maintenance of the New York State prisons for the current year, and the money will have to come out of the pockets, not of the do-nothing convicts, but those of the "honest laborers."

Governor Abbot, of New Jersey, in his annual message says he is satisfied that the "piece-price" plan, recommended by the friends of labor and adopted by the prison authorities, is the best solution of this labor problem yet presented, and that it cannot fail of success under the management of those who desire that it shall succeed.

It is rumored that Germany is making overtures for the partition of the Samoan Islands. The proposals, it is said, include the allotment to England of Savaii, the largest island of the group, Germany taking Upolu, with the port of Apia, and the United States getting the Eastern Islands, including the harbor of Pago Pago.

A correspondent in San Francisco says it has been decided that the late ex-Senator Sharon's gift of \$50,000 to Golden Gate Park shall be expended on marble gates. The gates, with wings and facade, are to be 400 feet long, and the central facade, 60 feet in height, will be pierced by three arches. The two wings will be built as colonnades.

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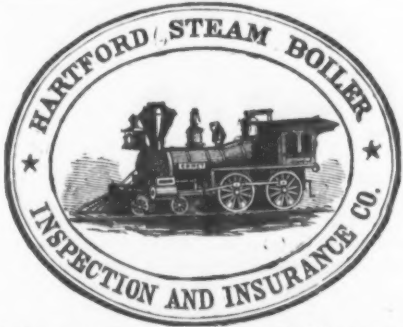


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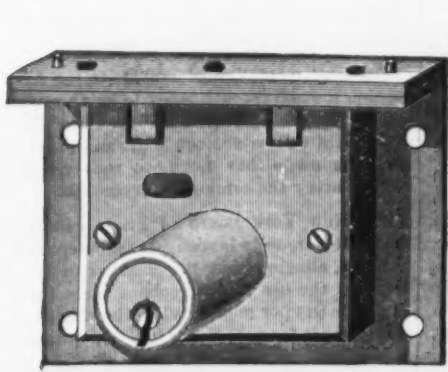
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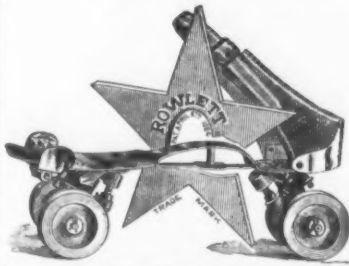
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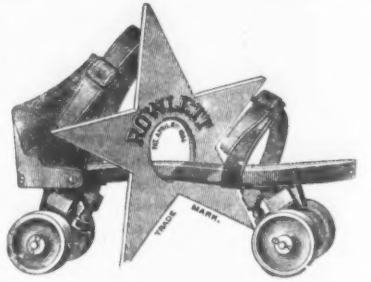
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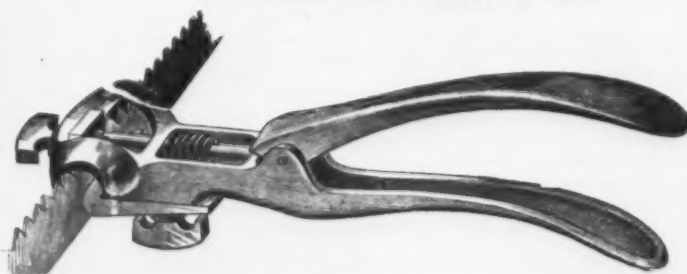
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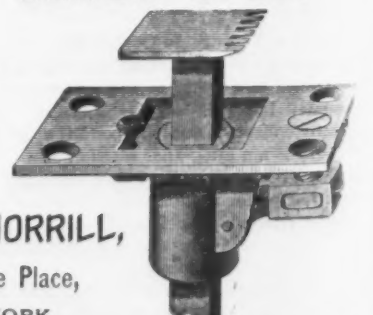
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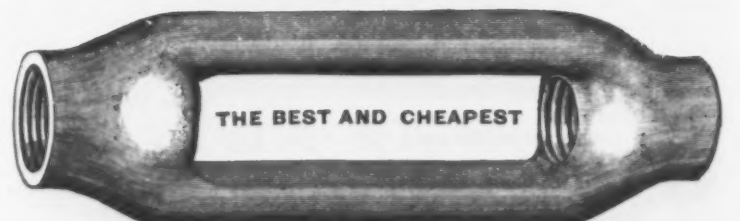
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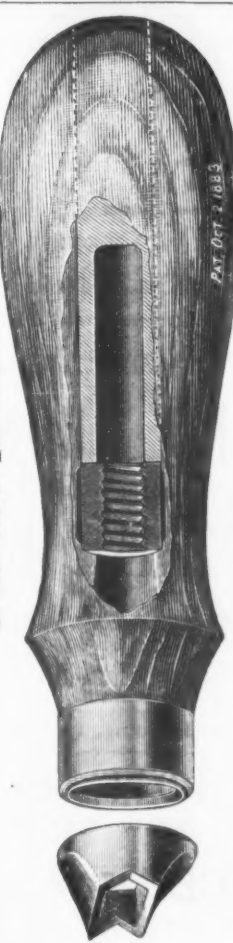
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Foreign Markets.

FRANCE.

PARIS, January 15, 1886.—*Metals.*—Our market has shown a moderate demand only during the week, sales being restricted to filling current consumptive requirements, with a decline in Copper and an important report in Lead, which quote at the close, in francs per 100 kg.: Copper, Chili Bars, 104 @ 110; Ingots and Slabs, 112; Best Selected, 115, and Pure Corocoro Ore, 107.50. Tin, Banca, 255; Billiton, 247.25; Straits and Australian, 250, and English, 247.50. Lead, 31 @ 32, and Spelter, 40 @ 41.50. Iron.—Business has been picking up very slowly in the iron trade in France, as is usually the case during the first fortnight of a new year, but from a general point of view the outlook has undergone no unfavorable change. We are aware that this year the Government and this city will spend a great deal of money to carry out certain public works for which the funds have either been voted or will be, and that in this respect it will differ materially from last year, but we shall have to wait for milder weather ere anything can be undertaken, and till then we have only the private requirements to attend to, which so far are light; hence the price of Merchant steel remains 13 francs per 100 kg. here. At St. Didier manufacturers of Chains have got tired of losing from 3 to 4 francs per 100 kg. on all they sell, and have by common agreement raised the price sufficiently. Valenciennes still reports a dull market, and at 12 francs for Merchant. Horseshoes are selling very low there, at 20 francs per 100 kg. Coal is less active here.—*Moniteur des Interêts Matériels*

BELGIUM.

BRUSSELS, January 15, 1886.—*Iron.*—The first fortnight of the new year has proved a disappointment so far as activity in the iron trade in Belgium is concerned, but this ought not to disconcert us. The better feeling and increase of orders noticeable last month were not encouraged, unexpected as they came, to admit of a resuscitation of the gloom and doubt which characterized the greater part of 1885. Nor is anything changed since then; and we are fully aware that at prevailing low prices Holland and Java are anxious to go on buying the railroad material among us they stand in need of, because the money is all ready to push on the construction of railways there duly contracted for; the local demand we know will absorb this year about five times as much of Sleepers and other railway material as last year. If not sooner, March will bring us many commands from there and other sources, while the usual consumption of the country will expand as we approach spring. A question much debated during the week, not only in the Chambers, but also in public, is the question of lowering the freight on Domestic Pig Iron sufficiently to enable it to compete with English and other foreign without a protective duty. Since we have the Government railroad we may as well enjoy the benefit of low freights on our own wares. Coal.—The Coal trade is satisfactory this winter; the demand is larger than usual and prices are well upheld.—*Moniteur Industriel*

GERMANY.

HAMBURG, January 15, 1886.—*Iron.*—The improvement in Pig Iron continues, although in some instances it does not extend beyond sustaining prices. The demand for Spiegel both for home use and export has been unabated, and prices are still steadily rising. Both Spiegel and Pudding Pig are being exported from Rhenish-Westphalia on a satisfactory scale, and of the latter consumers have most of them laid in a supply for the first quarter, but this does not check the demand, as stocks are reduced to a mere trifle in their hands in many instances. Both Bessemer and Thomas have been fully sustained. As meanwhile foundries complain of a lack of work Foundry Pig has been weak. The rolling mill branch can show little so far to boast of; prices are, perhaps, a little firmer for Finished Iron, but they certainly are no higher. The few orders received have been at extremely low rates, say 98 @ 100 marks for Rod Iron, Beams even below this. Hoops are still tending downward. Sheets, in spite of better prospects, have not improved in price; they show that the demand from Boiler-Makers is still light, and this sheet is depressed quite as much. Merchant Iron is stagnant for the moment. A good opinion is meanwhile entertained of Wire Rods and Wire Nails, and there are plenty of buyers wishing to buy ahead; January is the month when the demand for these usually increases. Steel Rails may be quoted 140 marks. Metals—Have been neglected and are without any outspoken tendency.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, January 10, 1886.—*Tin.*—The market has displayed great firmness at 56 @ 56.25 guilders per 50 kg. for Billiton, while Banca is still obtainable at 57.

Tin Statistics.

	Nov. 30, 1885.	Dec. 31, 1885.	Dec. 31, 1884.
Banca stock on warrants.	30,065	23,300	36,976
Billiton stock in Holland.	30,508	18,403	35,800
Total.	60,573	41,703	72,776
November and December deliveries of Banca.	10,300	6,865	8,356
November and December deliveries of Billiton.	8,300	8,165	6,440
Total.	18,600	15,030	14,806
Banca deliveries since January 1.	123,608	130,473	120,189
Billiton deliveries since January 1.	106,504	114,069	104,050
Banca afloat.	1,000	3,080	23,034
Banca stock with Netherland Trading Co.	70,911	74,406	89,858
Billiton afloat.	21,290	31,460	38,500
Price of Banca.	56 1/4 fr.	56 3/4 fr.	46 fr.
Price of Billiton.	56 1/2 fr.	55 3/4 fr.	45 fr.

—Koch & Vitterboom.

SPAIN.

MADRID, January 13, 1886.—*Metals.*—As per Government returns the shipments from Spain during the first 10 months were as under:

	1885.	1884.	1883.
Calamine.	27,654	34,735	31,400
Pyrites.	491,252	528,967	529,148
Iron Ore.	3,558,282	3,263,108	3,287,216
Ingots Copper.	19,446	15,026	22,581
Quicksilver.	495	1,179	1,002
Pig Lead.	102,994	95,589	97,981
Total.	4,190,418	4,008,954	4,169,623

Iron Ore shipments from Bilbao during the past eight years:

	Abroad.	Coast.	Abroad.	Coast.
	Tons.	Tons.	Tons.	Tons.
1885.	3,225,982	34,596	2,500,532	50,017
1884.	3,155,482	41,116	2,345,596	45,154
1883.	3,375,234	44,953	2,779,111	42,412
1882.	3,092,542	44,634	2,224,730	30,525

There has been a large business done at Bilbao during the fortnight, especially in good Red Ore, Campanil selling at 6/9, @ 7/ spot and futures; superior at 6/6, and the lower sorts at 6/3.—*Revista Minera.*

EAST INDIES.

CELEBES, December 9, 1885.—*Tin.*—The market opened a fortnight ago at \$31, and closes at \$31.75. Receipts run up 9000 piculs, Europeans taking 7800, and Chinese, 2700. Total shipments hence during the first 11 months, 133,511 piculs to England; 1844 to the Continent, and 17,405 to the United States.—*Schmidt, Kuermann & Co.*

COLOMBO, December 4, 1885.—*Plumbago.*—Has been quiet and steady, large lumps at \$13.10, cost and freight; ordinary, \$12.10; chips, \$9.12/6, and dust, \$6.12/6, with 5/ less if by sailing vessel.—*Volkart Brothers.*

CHILI.

VALPARAISO, November 27, 1885.—*Copper.*—Opened a fortnight ago at \$15.80 per quintal for ordinary bars, and under the influence of favorable cable news advanced to \$17, in order to close at \$16.30. Sales, 25,000 quintals at \$15.80 @ \$16.30; \$16.30 is equal to \$41.19/8, with a steamer freight of 30/ and 25/6 exchange. Nitrate.—At the lique meeting of the 23d inst. the combination

was continued till the close of next year. The amount to be produced in 1886 was fixed at 10,000,000 quintals, with the proviso that by mutual agreement it may later on be increased. After the result of the meeting transpired there was a better demand for December shipment, but only one cargo sold at \$3.55 for 95%. January and February shipment sold at \$3.35 @ \$3.40, but higher prices are insisted upon. Sales aggregate 191,400 quintals for the fortnight. The price of \$3.40 equals 10 1/4 d. Coal has been very quiet at 20/ Orell, 22 @ 23/ West Hartley, and 19/ @ 20/ Australian. Exchange, 90 days, London, 25 1/2 d.—*Weber & Co.*

AUSTRIA.

VIENNA, January 10, 1886.—*Iron.*—It had been confidently hoped that after stocks were taken and balance sheets drawn there would be some revival in the iron trade, but we perceive no indications of it yet, nor do we expect a better tone and demand till iron masters shall have agreed to curtail the output. After a while stocks will have to be replenished, orders for railroad material will be received and building in the great cities recommenced, but six weeks may pass by ere we see much of all this. Meanwhile the iron market is dull and unaltered.—*Austrian Trade Journal.*

SCIENTIFIC AND TECHNICAL.

The Effect of the Genesis of Coal Upon its Properties.

A question widely discussed at times by geologists has been whether the diversity of the floss, from which our present coal seams originated, has had any effect upon the chemical composition or the physical properties of the coal. Some have held that such must be the case; others have urged that the circumstances attending carbonization so much preponderated in their influence that the character of the fossil plants was entirely crowded into the background. Mr. Ad. Carnot has attempted to solve this problem experimentally. Carefully chosen samples of different fossil plants, whose structure was well preserved, were analyzed with the following results:

	Carbon.	Hydrogen.	Oxygen.	Nitrogen.
Calamodendron.	82.05	4.78	11.89	0.48
Corallites.	82.84	4.88	11.84	0.44
Lepidodendron.	83.28	4.88	11.45	0.39
Psaronius.	81.04	4.80	13.2	0.44
Ptychotis.	80.62	4.85	14.53	
Megaphyllum.	85.37	4.40	12.35	

Elementary analysis therefore showed nearly no difference in the composition of the different fossil plants, but quite another state of affairs was reached in conducting a series of distilling tests. Deducting moisture and ash, the following average values were found:

	Volatile matter.	Solid residue.	Character.
Calamodendron.	35.3	64.7	Coking well.
Corallites.	42.2	57.8	Swelling pretty well.
Lepidodendron.	34.7	65.3	Coking well.
Psaronius.	39.5	60.5	Swelling a little.
Ptychotis.	39.4	60.6	Swelling a little.
Megaphyllum.	35.5	64.5	Coking well.
Col. from large seam, Common.	40.6	59.4	Swelling a little.

It will be noted that, while the elementary composition is nearly the same, there are pretty large variations in the relative quantities of volatile matter and solid residue. This is due to the fact that the different elements are grouped in a different manner. The same observation may be made with living plants. As an example, the following analyses of Gottlieb, of Copenhagen, may be quoted:

	Carbon.	Hydrogen.	Oxygen.	Nitrogen.
Carbon.	50.16	50.31		
Hydrogen.	6.02	6.30		
Oxygen and nitrogen.	43.36	43.38		
Nitrogen.	0.99	0.04		
Ash.	0.37	0.37		

Although nearly identical in composition, their physical properties are very different. The experiments quoted would seem to indicate that the age of the coal and the circumstances attending its genesis do not exclusively influence its quality.

Eskimo Building-Snow.

Lieut. Frederick Schwatka has sent to Science a photograph which he obtained from General Loring, of the Boston Museum of Fine Arts, of snow impacted on a telegraph pole by a strong gale near the summit of Mount Washington. "It furnishes a good example near home," says Lieutenant Schwatka, "of the texture of snow under the influence of a fierce wind and intense cold, and will make clear some remarks I have previously made in your journal regarding the use of snow by the Eskimo among whom I traveled. In my description of the 'igloo' (snowhouse) of the Inuit, in Science during the summer of 1883, I mentioned that the first snows that fall are not used by the Eskimo of my acquaintance to build snowhouses, the preliminary igloos being of ice for three or four weeks, until the deep drifts of snow had been subjected to very low temperature and the 'packing' influences of strong winds. The winter weather of the summit of Mount Washington is in most respects essentially Arctic." The photograph readily showed the peculiar texture or strong "binding" power of the snow under these conditions of wind and cold.

"The cohesion of snow in our latitudes (and the early snow of the Arctic)," continues Lieutenant Schwatka, "is of a plastic, wet, or 'pasty' character, as shown in the making of snowballs, the formation of huge balls of snow on the ground as they roll along, snowmen, balling on horses' feet, &c. This is essentially unfit for snow-building. The snow fit for igloos is of a dry, almost stone-like character. The cutting of a thin portion from the side of an Arctic snow-block, instead of giving a sheet of plastic snow, as from a snowball, produces a shower of fine powder, exactly the same as from a large lump of loaf-sugar. In short, the Arctic building-snow block stands in about the same relation to those we would make here as the brick just from the mold, and before it is dried, bears to the same object when burnt in the kiln and ready for use. The Arctic snow-blocks ring like a well-burnt brick, and this is especially noticeable during intensely cold weather, when I have heard a snow-block, as it was struck with a knife, give forth a clear, metallic, musical sound, not unlike the striking of a highly-tempered bar of suspended steel with a hand or other non-metallic substance."

"I remember, when my natives were building a snowhouse on the high 'divide' between Back's Great Fish River and Hudson's Bay, the thermometer in the minus

60's, that a block of snow rolled down the hill for 15 or 20 feet, and I doubt if a rolling guitar would have given forth many more confused musical tones than the bumping block as it struck and bounded along down the hard, stone-like bank of the snow. Yet it must not be inferred that this dry, compact snow has any of the characteristics of ice about it. It is not only much lighter than ice, but, I believe, lighter than the plastic snow we have, certainly not so dense as when made into the ordinary snowball. In fact, the least quantity of ice in the snow—which sometimes happens—renders it more or less worthless for building, according to the amount. In the late spring banks of snow having southern exposures, and thawing slightly about noon, only to freeze again, and others subject to drainage (and a few other causes), often have ice permeating the mass, sometimes in little fine needles, which make the mass worthless, and now and then in little crystals scattered through it. If these crystals are much larger than a pea and more numerous than 1 to about every 4 square inches exposed by a section, the bank is rejected by the Eskimo snow-builder, unless others cannot be found.

"The packing of the wind and low temperature are needed to produce the true building-snow, and, in the absence of either one of these conditions, the action of the other seems to be worthless. As to temperature, this is shown by the snow not being good, as judged by the Eskimo, until it is *de-ker-on ad-to* (very cold), despite the fiercest gales having occurred. It is shown as to the wind by not finding good building material in deep gorges, and other places where the wind cannot get at the snow to pack it down, long after it is perfect in other localities. My information on these points did not come from such observations, however, but directly from Eskimo explanations, and I add these to corroborate them. I do not believe—although I do not positively know—that both wind and low temperature must come together, but both must have happened before the Eskimo will use the snow for building, though possibly the two may be independent in time. When I say the Eskimo will not use it, I mean as a usual thing and in a general way; for in his cheerless country he is often driven to dire expedients, and does many things under a sort of polar protest. I learned in several ways of attempts to reproduce these domiciles in our country having ended in failure. Of course the main reason of such failures was in the lack of knowledge to construct the igloo, the manual dexterity needed, it being an art which requires no small amount of the early life of an Eskimo to acquire to that perfection we often see among them; yet the builders who failed in their undertakings may console themselves with the fact that it is only in rare cases that the snow will be of the right texture in so low a latitude. The Alpine districts, as Mount Washington in the winter, and similar places, might do. Eberling (Eskimo Joe), as he was known in the United States, my interpreter, told me that he had built a few igloos in the United States for the edification of curious crowds, but he was only too glad not to see them tumble in and ruin his reputation as well as the house; but, as to living in them, he would never have thought of it.

Making Sea Water Potable.

A London maritime magazine, *The Shipwrecked Mariner*, reports in a recent issue the main drift of a scientific paper on making sea water drinkable. The writer, Mr. Thomas Kay, described his process before the Manchester Philosophical Society as consisting in the removal of the chlorides from salt sea water by the use of citrate of silver. Mr. Kay states that 1 ounce of citrate of silver will convert 1/2 pint of sea water into a drinkable fluid, and that a man can keep alive on it a day. Seven ounces of the citrate will convert enough briny water into potable water to sustain life a week, and he proposes that bottles of the citrate of silver should be secured in the lifeboats of ships, to be used when absolutely required. In Atlantic water, analysis shows, there is only about 3.5 per cent. by weight of the chlorides and all foreign matter, while about 78 per cent. of all the saline matters of the sea is chloride of sodium. Mr. Kay's plan, therefore, seems to be entirely practicable. There is no doubt that were it tried and found to work well it would be the means of saving the lives of many shipwrecked mariners.

An Imitation of a Hard-Coal Fire in Burning Natural Gas.

The *Crockery and Glass Journal* relates a peculiar discovery that was made at the pottery of Ernst Mayer, of Beaver Falls, some time ago. It appears that they were desirous of securing a black glaze, and in making the experiments for this purpose several pieces of sagger were dipped in the glaze mixture and fired in the office stove. The experiments produced quite a number of pieces, which were collected together and would probably have been thrown away after the result had been attained had it not been for a happy thought which immediately changed the apparently worthless bits of sagger "sherd." The irregular pieces of clay covered with a black glaze were so much like anthracite coal that the idea suggested itself to place a lot of them in a grate where natural gas was being used for heating purposes, and the effect was surprising. The gleaming black chunks of sagger, becoming heated by the play of the gas flame through the interstices, soon took on the appearance of a bed of glowing coals, and, further, the radiation of heat from the artificial coals almost doubled the heating-power of the gas. Enough of the mimic coals were made to fill several grates, and a patent was applied for to protect the discoverers from infringement. The imitation of a hard-coal fire produced in this novel manner was so perfect that the inventors soon found the demand sufficient to compel them to turn out the new jet in quantities, and they are now making arrangements to produce it on a scale large enough to supply the demand. The most singular feature of this discovery is the fact that the first pottery in this country to successfully reproduce coal in favor of natural gas should be the first persons to produce an imitation of the very article whose use they had rejected.

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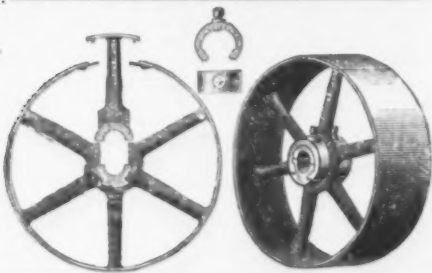
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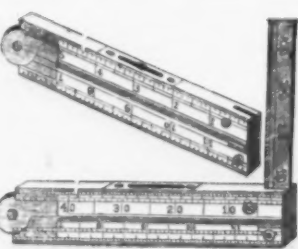
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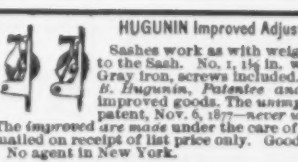
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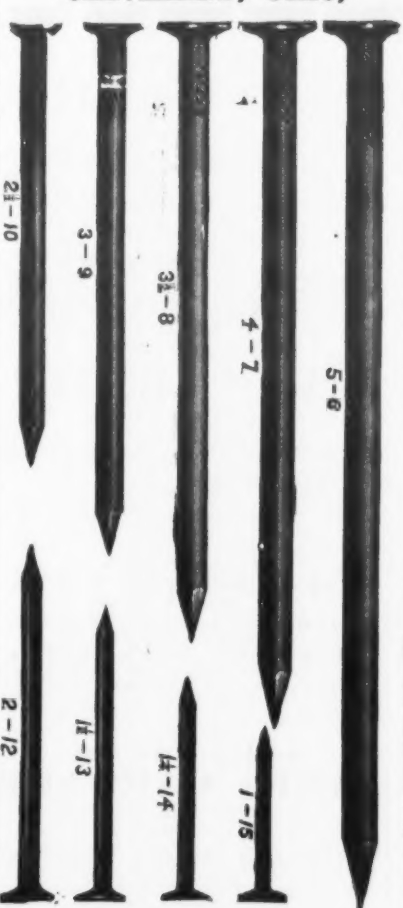


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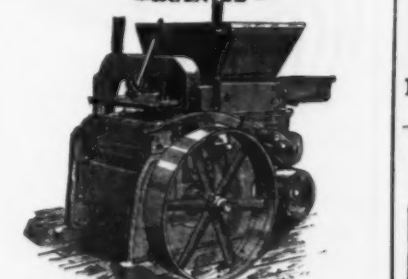
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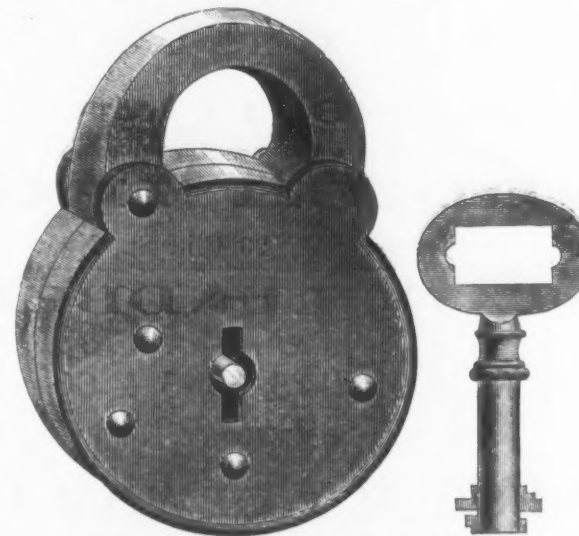
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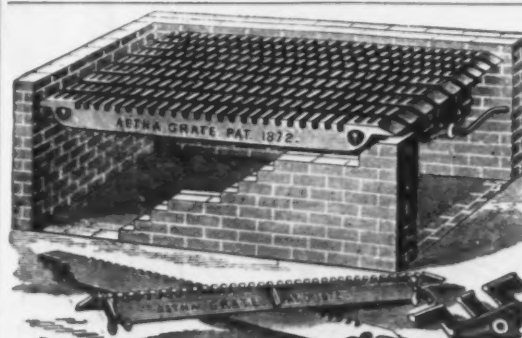
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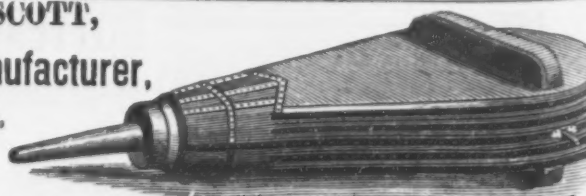
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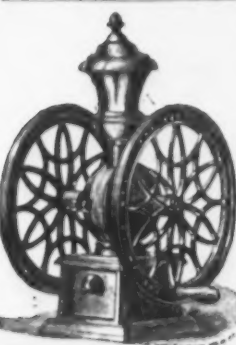
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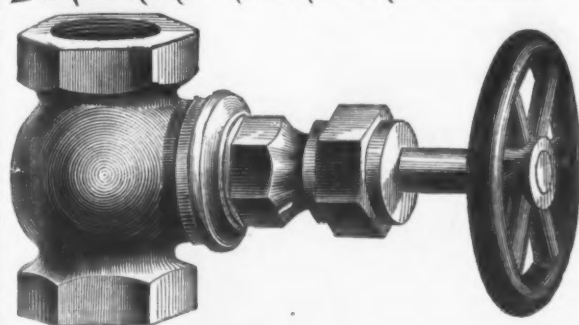
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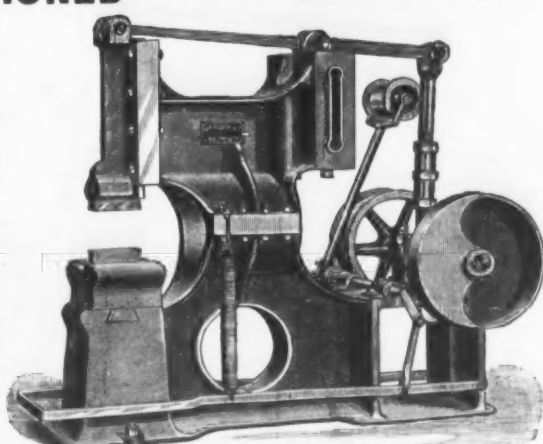
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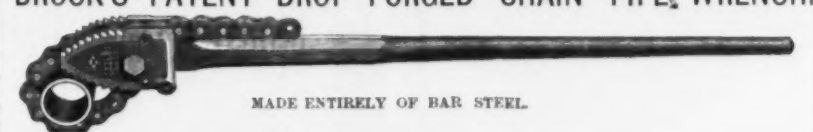
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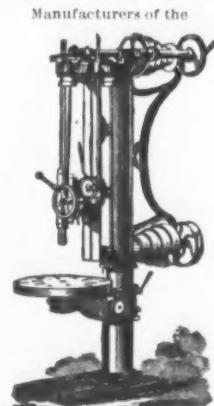
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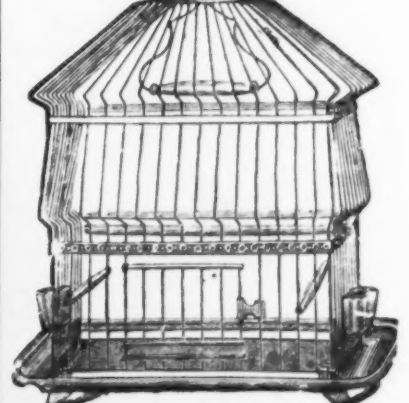
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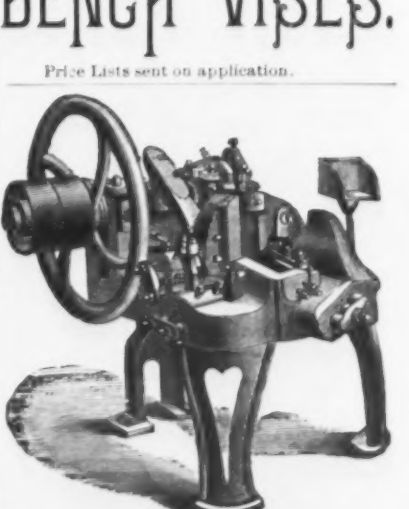
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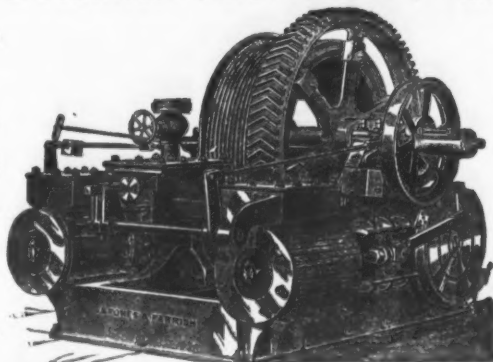
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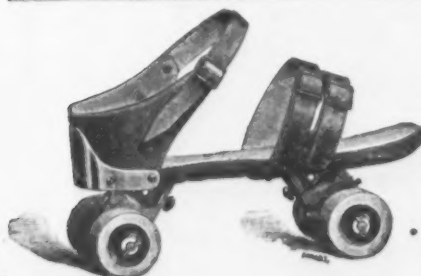
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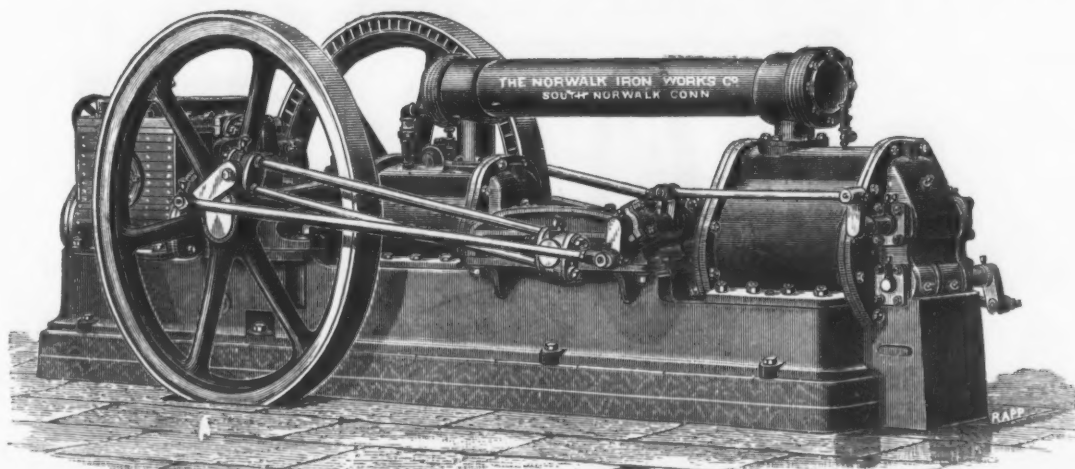
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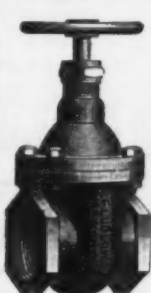
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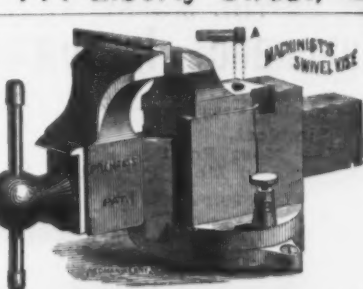
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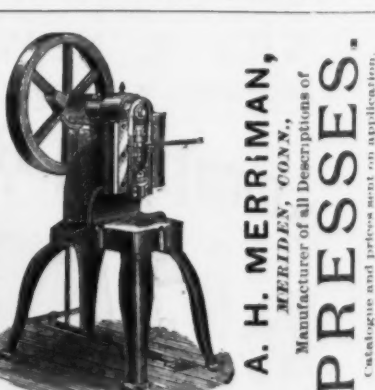
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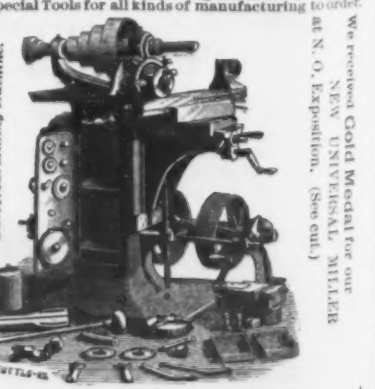
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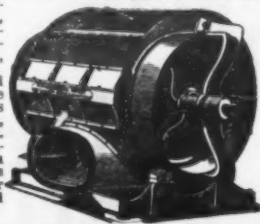
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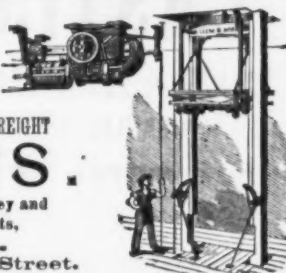
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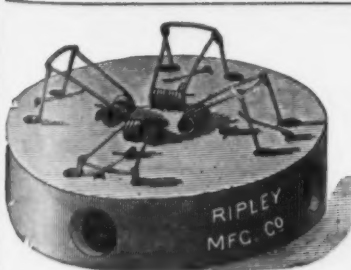
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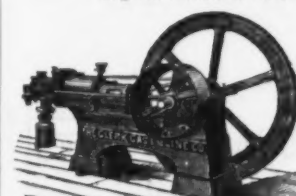
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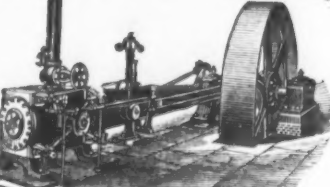
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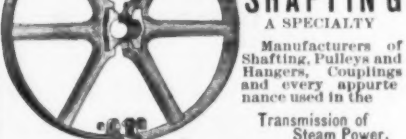
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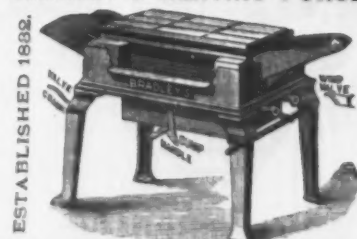
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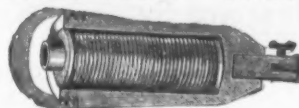
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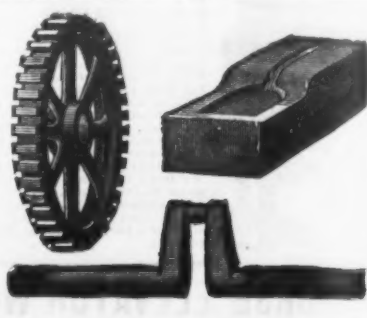


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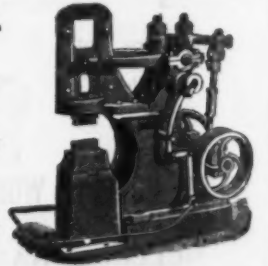
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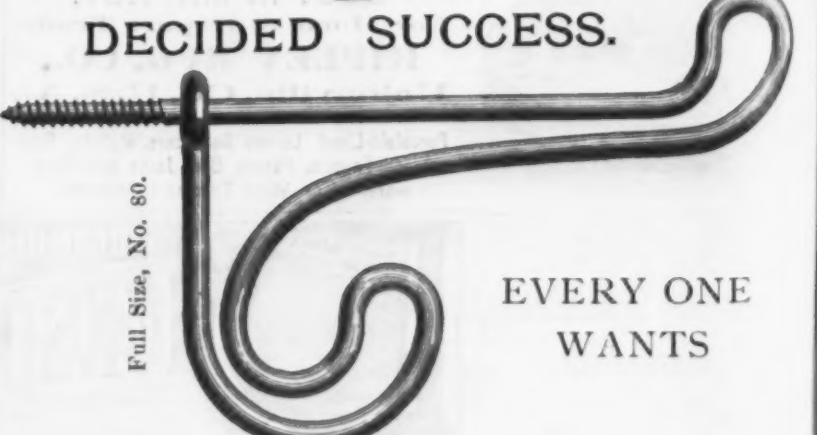
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